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# Camden Waterfront Revitalization

Philip L. Kianka  
*Clemson University*

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# CAMDEN WATERFRONT REVITALIZATION

CAMDEN

NEW JERSEY

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SPRING 1981

PHILIP L. KIANKA




CAMDEN WATERFRONT REVITALIZATION  
Camden, New Jersey


A sixth year terminal project submitted to the faculty  
of the College of Architecture, Clemson University,  
in partial fulfillment of the requirements for the degree  
of Master of Architecture.


Philip L. Kianka

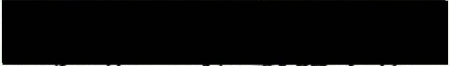
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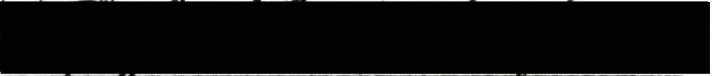
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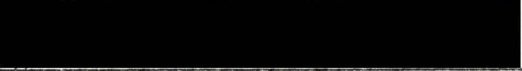
  
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Dedicated to my mother and father for all of their  
love and support and everything they have taught me.

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## **PROBLEM STATEMENT**

## PROBLEM

The subject of this terminal project is waterfront housing and commercial land development for Camden, New Jersey. The Camden Waterfront Site comprises an area of 34 acres. It permits the development of from 800 to 1,400 dwelling units, and up to 50,000 square feet of retail and commercial space. This proposal consists of 6.2 acres, denoted as Parcel A, within the downtown city limits along the Delaware River which has been designated for residential use by the City of Camden's Housing Authority. The form of housing is to be of mixed use housing throughout the developable land consisting of high-rise, townhouse and garden apartment construction.

## PROBLEM OBJECTIVE

The objective of this terminal project is to develop an architectural solution capable of establishing a comfortable and manageable urban housing environment with respect to the needs of its users in an urban environment.

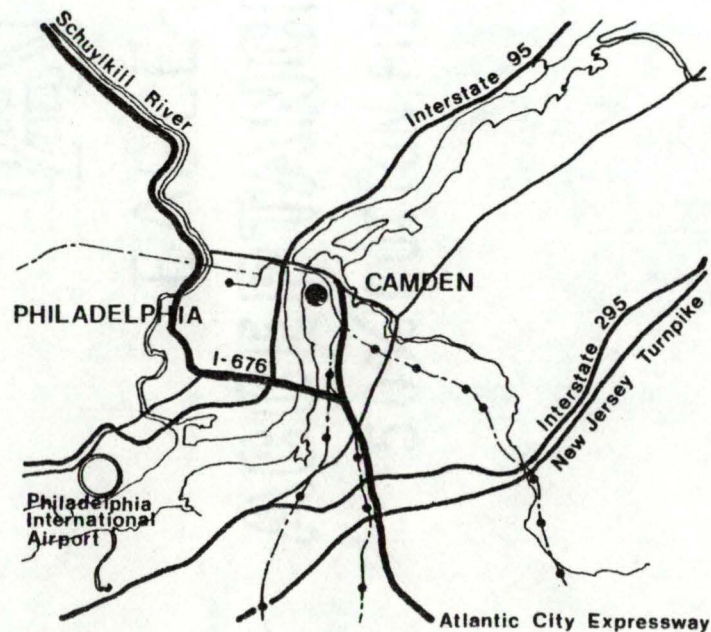


**BACKGROUND**



## LOCATION

The city of Camden is southern New Jersey's largest city. Over the past ten years, the city has undertaken extensive work to rebuild its downtown and surrounding central area. The first five of the ten years was dedicated to the major effort of clearing the deteriorated and obsolete structures where the central thoroughfare, Mickle Boulevard, is now located. The ten years of urban renewal activity began in 1970 with the elimination of the elevated rail line known as the "Chinese Wall." The railroad, previously owned by the Pennsylvania Reading and Seashore Line Railroad, had historically linked southern New Jersey to the Camden-Philadelphia ferries. A 160 acre City Centre Urban Renewal Project was the initial generator for removing the Chinese Wall, rail-yards and the adjacent structures. By 1973, clearance had largely been completed and Mickle Boulevard partly opened. In accordance with the City Centre Urban Renewal Project the Camden Waterfront Site



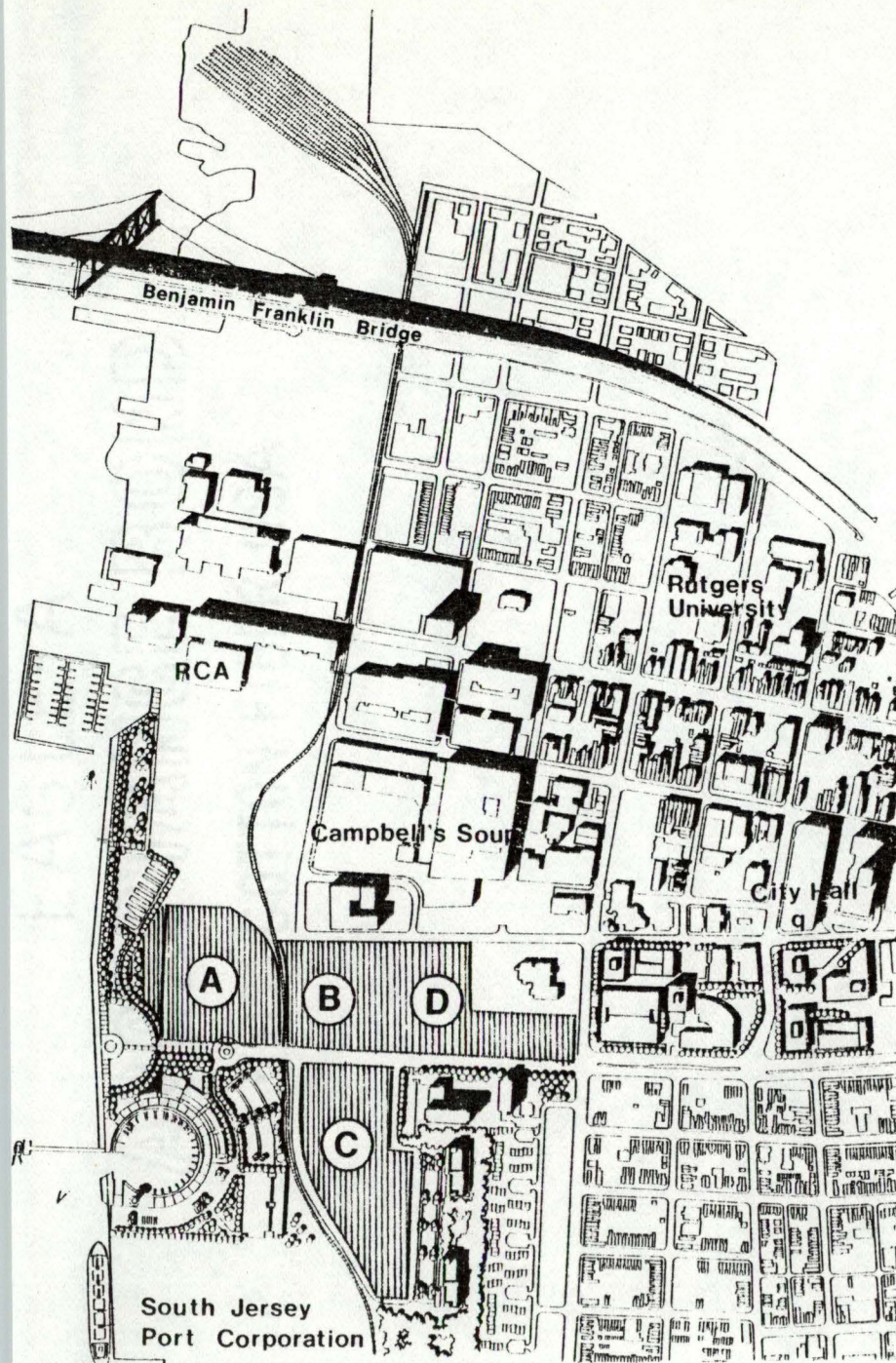
**Regional Site Location Map - Camden/Philadelphia**

has been chosen as the ideal location for a moderate to upper income residential community to aid in rebuilding the city core.



## SITE LOCATION

The site to be studied in this project is 6.2 acres designated as Parcel A in the City Centre Urban Renewal Project. It is directly adjacent to the newly proposed Camden Waterfront Park along the Delaware River. It is bounded by its main access route, Mickle Boulevard, to the south, a rail-freight line at the east and the parking lot owned by RCA to the north.

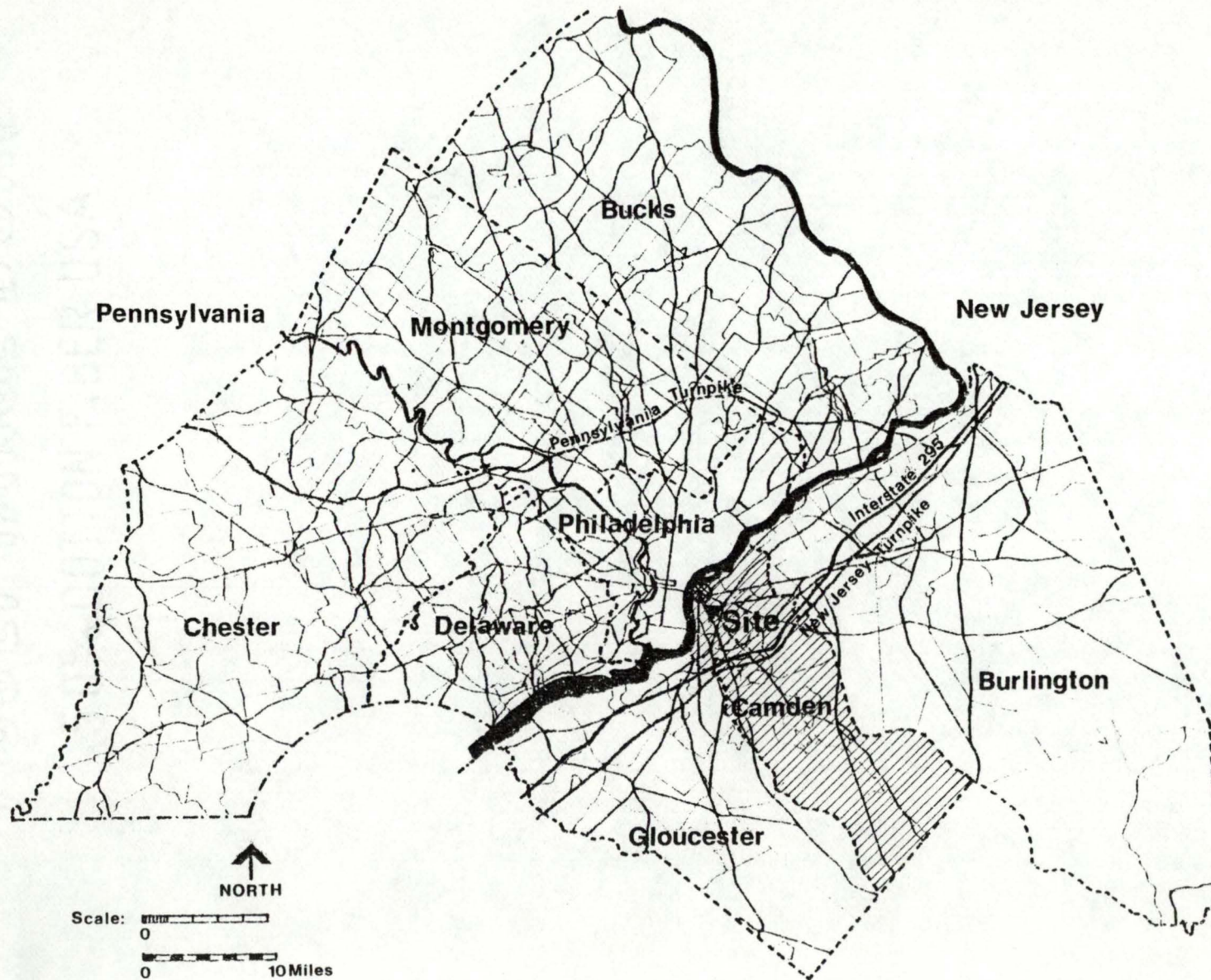




**SETTING**



## CAMDEN/PHILADELPHIA AREA





## CAMDEN COUNTY

There are thirty-seven civil divisions in Camden County. The upper half of the county is evenly divided between the urban and the suburban. The large rural communities, Waterford and Winslow, form the predominate part of the southern sector of the county. The largest city is Camden with a population of 102,551 representing about twenty-two percent of the county's population. The second largest area is Cherry Hill. During the 1950's and 1960's, Camden County experienced a rapid increase in its growth pattern; however, the growth during the more recent decades has dropped considerably.

## CAMDEN/PHILADELPHIA DESCRIPTION

The Camden/Philadelphia metropolitan area was projected to contain a population of 6,000,000 by the year 1980. The entire region offers a diversified character and a variety of settings. The offering of the historical, cultural and physical environment is

abundant throughout the region with Philadelphia serving as the heart. The role of the City of Camden is expected to perpetuate the region even further as its importance to southern New Jersey increases. What formerly linked the two cities in the industrial sense has taken on a rejuvenated character in its urban context to a more social and populated state.

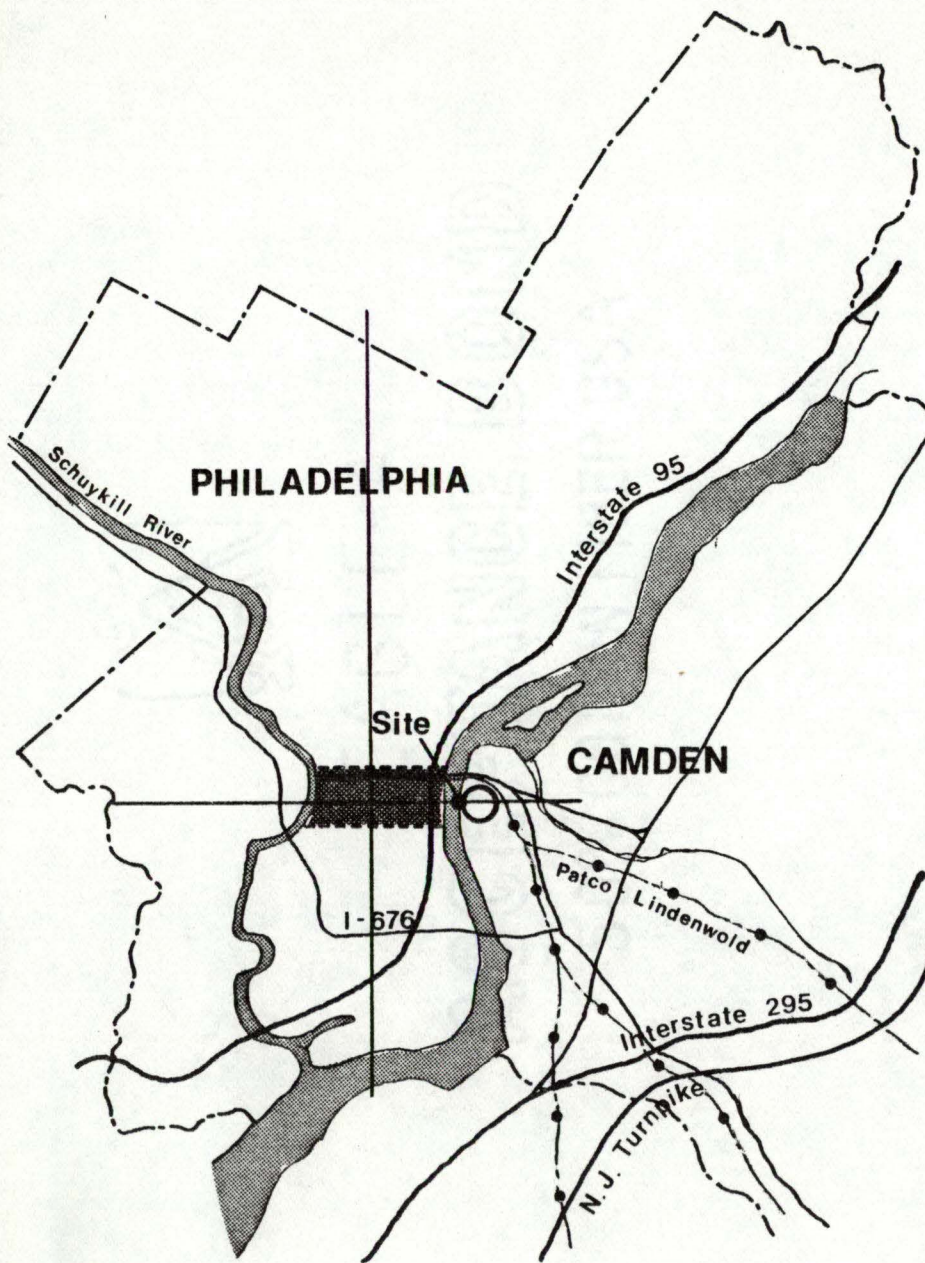


## AREA DESCRIPTION

The Camden Waterfront Site offers a broad prospectus for urban renewal development. It is four blocks away from the new Interstate 676, connecting to the Benjamin Franklin Bridge to Philadelphia and the Atlantic City Expressway to the south and east. The waterfront setting, the availability of newly proposed mass transit opportunities and its travel accessibility provide an ideal containment for a city center residential community.

A particular advantage of the Waterfront Site is not only its proximity to the major avenues of New Jersey, but its association with the city of Philadelphia. The visual corridors across the Delaware River provide excellent views of Penns Landing and Society Hill Towers within one of the nation's largest metropolis regions.

Mickle Boulevard is proposed to become the central avenue in an attempt to begin the rebirthing of the city. According to the City Centre Urban Renewal





Project, the avenue will provide the city with a sufficient mixture of land uses complimentary to the waterfront housing community.

The major local influences to the site are the city's heaviest employers, RCA and the Campbell Soup Company. Although an industrial neighbor is not favorable or normally acceptable along a residential community, each corporation has given their full concern and cooperation to revitalizing the City of Camden and more immediately, the Waterfront Site.





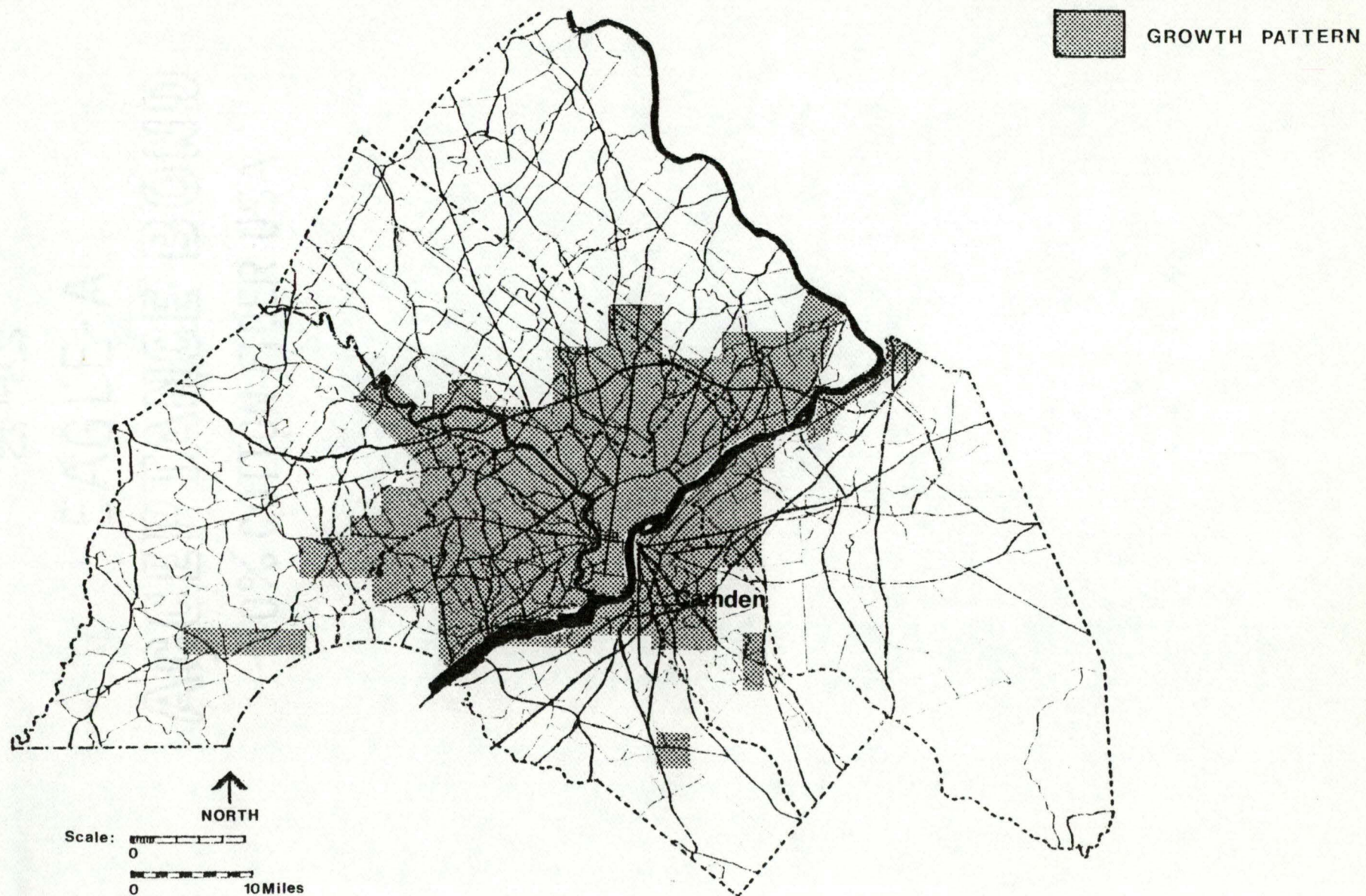
**Aerial View Looking at the Site**



# **ENVIRONMENTAL ANALYSIS**

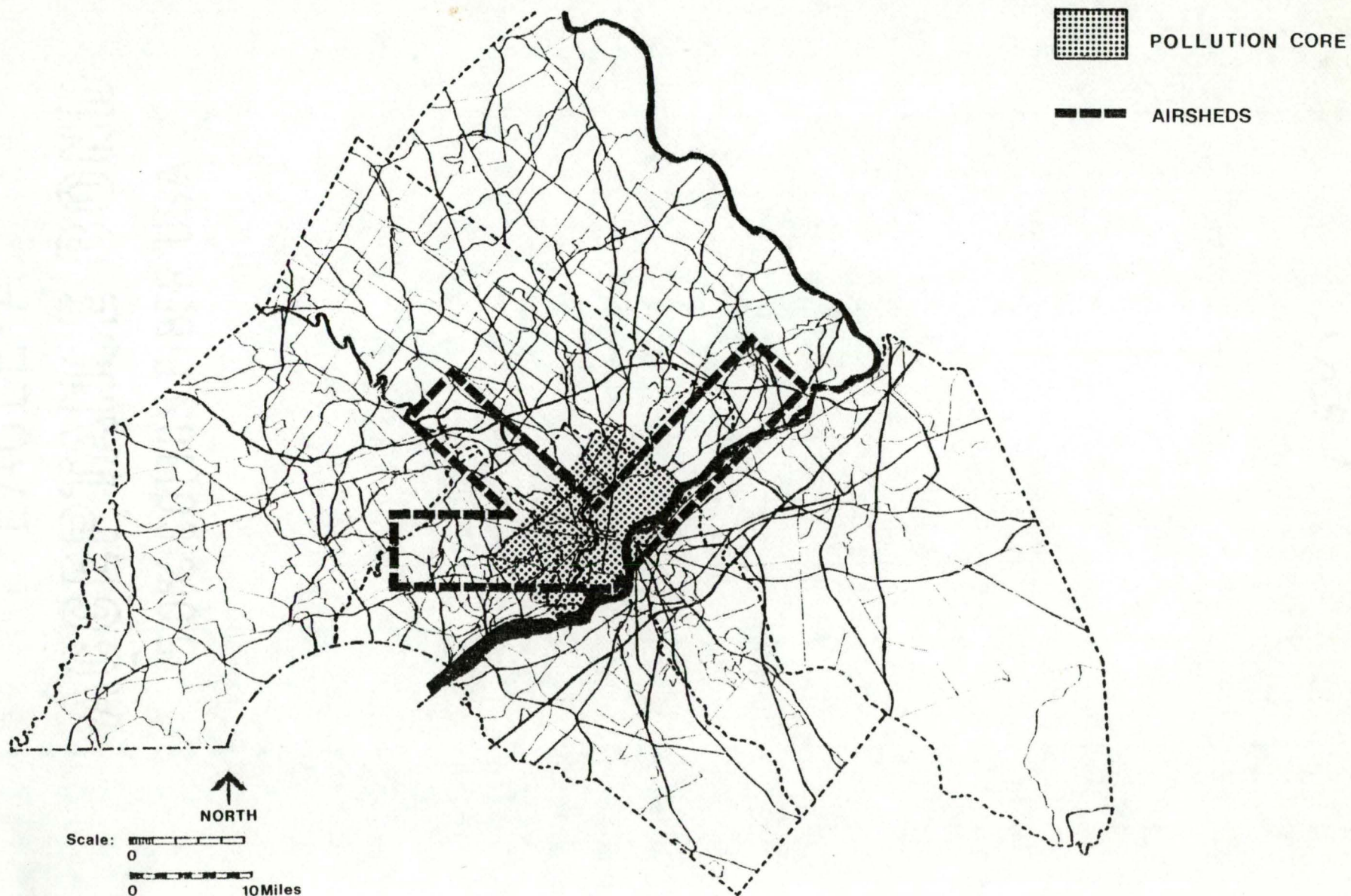


## GROWTH OF URBANIZED LAND



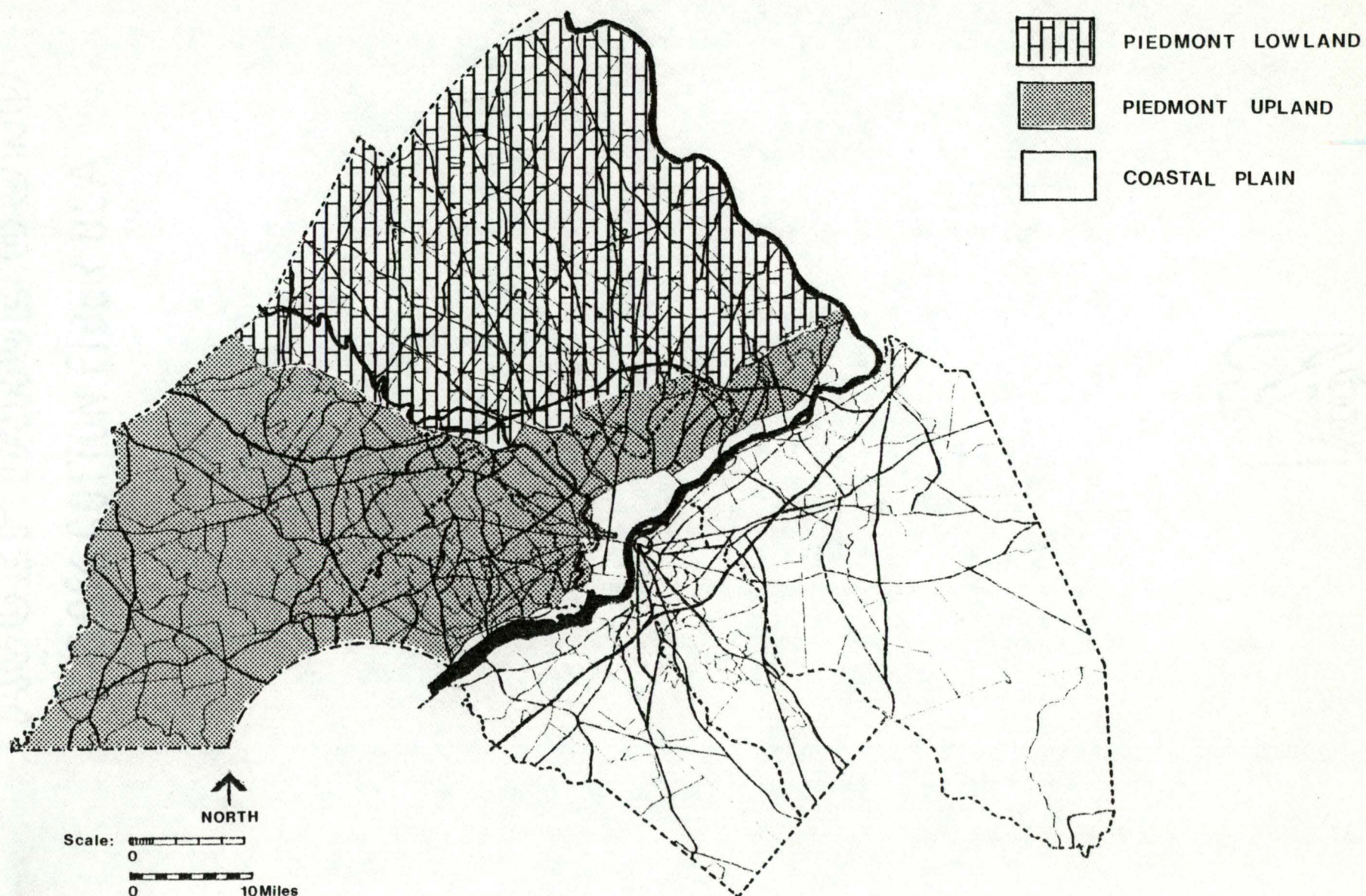


# POLLUTION CORE



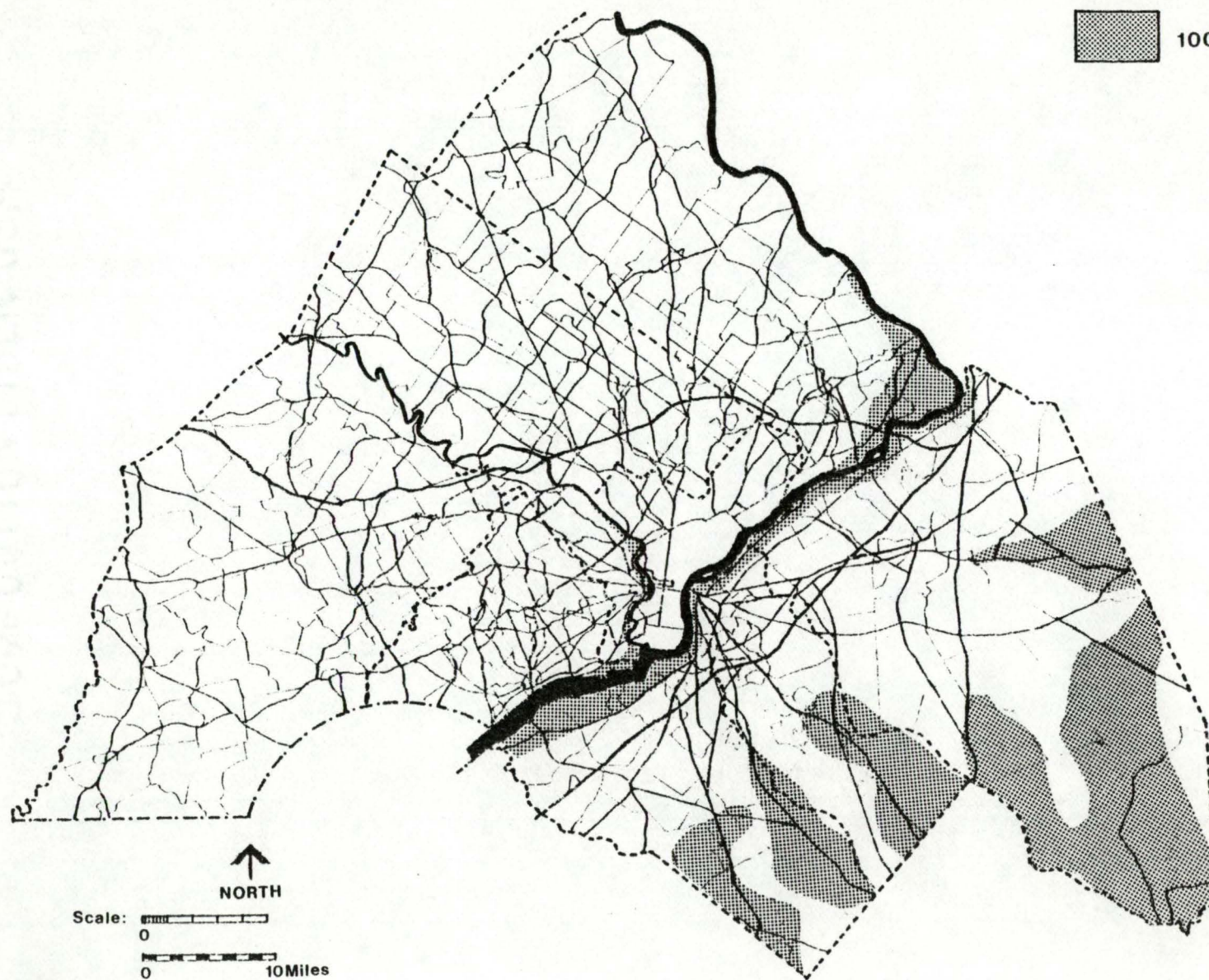


## PHYSIOGRAPHIC REGION





## FLOOD PLAIN REGIONS

 100 YEAR FLOOD PLAIN



#### URBANIZED LAND 1970

The urbanization pattern of the Camden and Philadelphia region is increasing at a relatively slow pace compared to the suburban areas surrounding the metropolis. Out of the 3,500 square miles or 2,250,000 acres, less than thirty percent of the land area was urbanized by 1980.

#### POLLUTION CORE

Urban areas tend to be an environmental concern whenever pollution levels are already reaching the saturation point. Many urban areas fit into the air quality category of the "worst in the state." The concentration of pollution sources in Philadelphia cover an area of fifteen miles by ten miles with the axis running northeast. The Camden area is on the edge of the Philadelphia pollution core.

#### PHYSIOGRAPHIC REGION

The component regions of the Camden/Philadelphia region are: first, the Uplands of the Piedmont, second, the Lowlands of the Piedmont and third, the Coastal Plain. The area consists of three and one-half thousand square

The area consists of three and one-half thousand square miles.

The Uplands are of the highest elevation containing a great lack of fertility. The Piedmont has a gentler slope and abounds with fertile soils. It is the most conducive to agricultural use. The Coastal Plain, within which the City of Camden lies, is abundant in marsh land and lacking soil fertility. It contains the flora of the pine barrens and is highly susceptible to flood.

#### FLOOD PLAIN REGIONS

Of a particular hazard to the urban waterfront development is the possibility of flooding. A major design determinant and parameter for a waterfront population is the issue of flood control and personal safety. The Camden Development areas along the Delaware River lies in the 100 year flood plain region and incorporates a new 1:2 stone bulkhead to be maintained by the Camden County Park Commission.



**CITY CENTRE  
URBAN RENEWAL PLAN**

## CITY CENTRE URBAN RENEWAL PROJECT

The City Centre Urban Renewal Project was initiated in 1968 as the motivator for removing the Chinese Wall, railyards and the adjacent deteriorated structures. By 1973, the stream of development was made available with the partial opening of Mickle Boulevard. However, the only recent positive addition to the downtown renewal area has been a new PATCO-Lindenwald subway linking Philadelphia to Camden and southern New Jersey.

The following outline is an analysis of the work that has already been completed or is under construction in accordance to the City Centre Plan. The development of these outlying areas provide a direct influence upon the development of the waterfront and its success as a residential community.

### Transportation Related Actions

#### Interstate 676

The forerunner, if not the cause, of Camden's gradual fifty-year decline was the opening of the



Benjamin Franklin Bridge with direct connections to southern New Jersey in 1928. The bridge enabled motorists to bypass Camden's downtown area. Along with the abandonment of the obsolete cross river ferries at the end of World War II, and government neglect in the 1960's, the downtown decay accelerated tremendously.

In 1973, plans were initiated to complete the proposed connections between the Benjamin Franklin Bridge Plaza and the New Jersey end of the Walt Whitman Bridge at Camden's southern gateway. The new \$40 million elevated expressway, Interstate 676, provides the necessary city-wide and downtown accessibility along with an immediate visibility.

An interchange at Mickel Boulevard, Federal Street and Admiral Wilson Boulevard provides direct connection to the Waterfront Site and downtown Camden.

#### 7th Street/Hadden Avenue Connector

A new \$1 million realignment of Seventh Street connecting the Benjamin Franklin Bridge Plaza to



Haddon Avenue and the Interstate 676 interchange is a key factor. It connects Federal Street and Cooper Street to the industrial sector of the city of Camden by a direct access.

#### Transportation Terminal

A new transportation terminal is located at Broadway and Mickle Boulevard, three blocks away from the Waterfront Site. The \$14 million facility combines 650 parking spaces along with first floor retail space, and connects to the Broadway PATCO Station by the use of covered pedestrian walkways. It contains Greyhound, Trailways, and Transport of New Jersey bus lines for waterfront dwellers to off-site areas.

#### CITY/COUNTY SPONSORED ACTIONS

##### Fire Administration Headquarters

In accordance with the City Centre Urban Renewal Project, a new \$1 million Fire Administration Headquarters and Ladder Company is located at Third



Street and Federal Street. The facility is one-half block from the Waterfront Site and provides complete fire security for the future developments of the parcelled lands.

#### Police Administration Headquarters

A new Police Administration Headquarters is located at Seventh Street and Federal Street. It is only four blocks away from the Waterfront Site.

#### Poetry Center

As a cultural benefit to the developing city core, a total renovation of the city's Poetry Center located at Second Street and Cooper Street has been performed. The center is only three blocks from the Waterfront Site and is being run in correlation with the new Rutgers University Campus.

#### Public Housing

Three housing projects in and next to downtown Camden have been developed with a great deal of



success. Mickle Towers, Riverview Towers and Royal Crown Court are adjacent to the Waterfront Site. They are federally funded housing projects for families and the elderly comprising 420 units. They were generated as a part of the relocation housing needed for other clearance programs taken on by the city.

#### CITY INVESTMENT

Private rehabilitation is now taking place in the Bergen Lanning neighborhood to the south of Mickle Boulevard. Total city investment is estimated at over \$3 million in community related improvements.

- \* Fourth Street and Washington Street Park and the Seventh Street and Clinton Street Park combine for a city park construction program totalling \$550,000.
- \* Demolition of hazardous and abandoned structures within the Bergen Lanning Square has amounted to \$218,000.



- \* The County Health Department has planned to build a new Health Center at Fourth Street and Washington Street. The estimated cost of the project is \$250,000.
- \* The reconstruction of Seventh Street from Benson Street to Washington Street will cost the city \$1.6 million.
- \* The demolition of dilapidated storefronts along Broadway for parking and new development has cost \$225,000.
- \* Additional improvements costing \$200,000 are programmed in the same area to go along with the new parks and Health Center.
- \* Second Street has been rehabilitated and re-surfaced from Ferry Avenue to Clinton Street at a cost of \$135,000.
- \* Atlantic Avenue from Front Street to Interstate 676 will be refurbished at a cost of \$1.3 million.



\* In addition to these community-related improvements, a new refrigerated warehouse will be located in the Port area.

#### SOUTH JERSEY PORT CORPORATION

Sixteen acres of property on the southern boundary of the Waterfront Site is being developed for the expansion of the South Jersey Port Corporation. The corporation is funded by a \$3.6 million UDAG grant and \$1.6 million in local bonding. An application has been submitted to establish it as a free trade zone for increased port effectiveness.

#### CAMDEN COUNTY ADMINISTRATIVE OFFICES

The downtown Camden area has established itself in the role as the administrative and governmental center of southern New Jersey. Approximate employment cross-sections from 1975 included, 1,000 federally employed personnel, 1,600 state employees, 1,100 county employees and 750 city office personnel. The Delaware Valley



Regional Planning Commission projects that by the year 2000, the total city employment will be approximately 50,000.

#### CAMDEN COUNTY HALL OF JUSTICE

The County Hall of Justice is the generator for an entire governmental complex to be positioned within a half of a mile of the waterfront development. It is the first step to developing Camden as the governing center of southern New Jersey and is expected to offer up to 3,000 employment opportunities for the city. The employees of the governmental center provide a potentially strong source of clientele for the waterfront housing development.

#### CAMDEN WATERFRONT PARK AND HARBOR

The Waterfront Park is the primary development of the entire waterfront proposal. Its integrity and atmosphere creates the foreground of the housing proposal. The response of the waterfront housing development is



projected to compliment the character of the park while offering its own identifiable environment. The integration of the two environments is expected to enhance the idea of the community yet provide proper response for the security of the housing proposal in denoting the public, semi-public and private spaces.

#### INSTITUTIONAL DEVELOPMENT

The City Administrators of Camden believe that institutional development will become a major factor in the revitalization of the city. Although the institutional commitment is not as sensitive to the marketability as retail, commercial and housing, it may nevertheless aid in establishing the setting for private developments. Along with the governmental employment demands, institutional expansion represents a potential source of the housing market demand structure for the Waterfront Site.



#### Rutgers University Campus - Camden

Through the consent of the City of Camden, Rutgers University has planned to develop a full university with a \$10 million expansion. The expansion includes housing for 300 students and a parking facility. The complex presently employs 472 full-time and 55 part-time personnel.

#### Camden YMCA

A new \$1.3 million facility at Federal Street and Third Street has been built in accordance with the City Centre Urban Renewal Project.

#### Cooper Medical Center/Veterans' Administration Hospital/ Rutgers and New Jersey Medical Complex

The Cooper Medical Center has chosen to fund a \$44 million addition to their present facilities. It will make them the largest medical complex in southern New Jersey and generate a great deal of potential new clients for the waterfront housing.



The joint venture of the City/County and Cooper Medical Center was responsible for initiating Camden as the choice for a new \$75 million Veterans' Administration Hospital, Nursing Home and parking facility. The facility is expected to offer up to 2,000 new employment opportunities.

In addition to the Cooper Medical Center and Veterans' Administration Hospital, the complex includes the College of Medicine and Dentistry of New Jersey with branch facilities of the Rutgers Medical School and the New Jersey School of Osteopathic Medicine.

Further major paramedical, private medical, laboratory, and support facilities are in various planning stages around the area of Cooper Medical Center and the Veterans' Administration Hospital.

#### PRIVATE DOWNTOWN DEVELOPMENT

##### Campbell Soup Company

Campbell Soup's executive offices are located just to the east of Interstate 676. The company recently



completed a \$3 million major plant expansion at Second Street and Federal Street as a complete modernization to its main manufacturing facility. Campbell presently employs 3,000 workers serving its downtown plant.

#### RCA

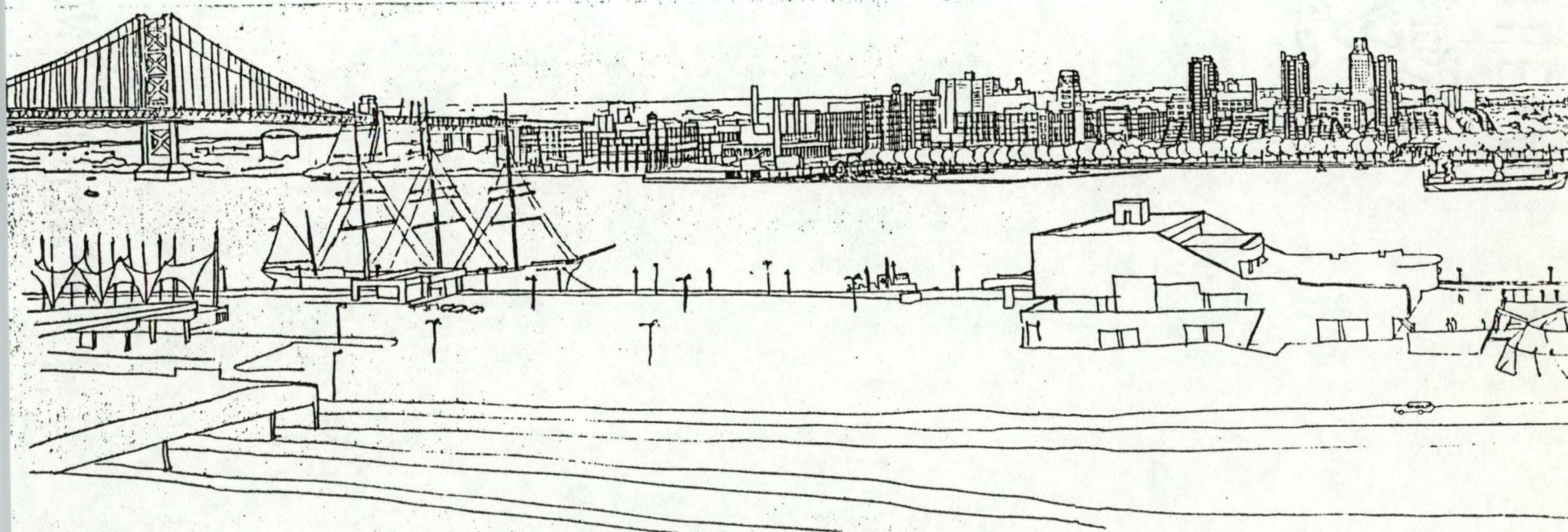
RCA maintains a major complex in downtown Camden and employs 3,500 workers. Their program includes a major engineering/office facility along Delaware Avenue and the river. The plant has conducted extensive studies in the past for the re-use of lesser efficient buildings and undeveloped private land. The company is one of Camden's major employers and takes a favorable view of the idea of extending the Waterfront Park along its parking lot to the north of the site.

#### Camden Gateway Project

An employment park plan has been proposed by the city of Camden for the Gateway area. The Gateway Project consists of the development of excess land



around the intersection of Interstate 676, Admiral Wilson Boulevard, Route 30 and the Benjamin Franklin Bridge Plaza.



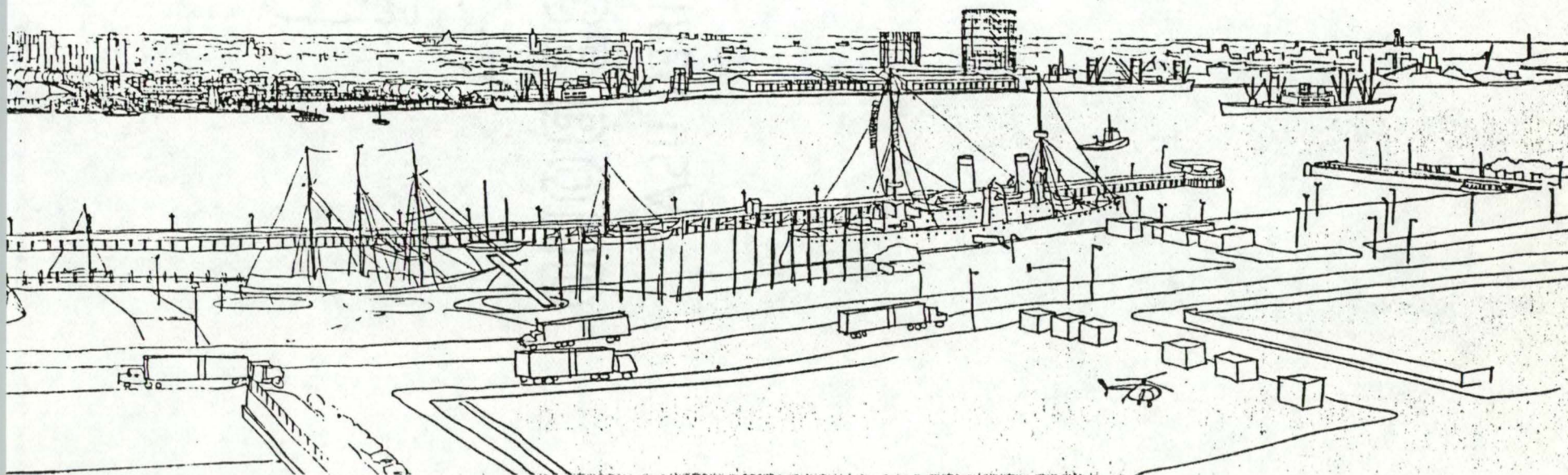
View of Camden Waterfront from Penns Landing



# Camden Statistics

Area: 10.2 Square Miles  
 Population: 102,551  
 Form of Government: Mayor-Council  
 Police-Resident Ratio: 1:260  
 Fire Protection: 11 companies, 400 paid firemen, 75% new equipment within the last three years  
 Utilities: Water-Municipal; Electricity-Public Service Electric and Gas; Gas-Public Service Electric and Gas; Sewer-Municipal; all are readily available to the Site  
 Hospitals: Cooper Medical Center, West Jersey, Our Lady of Lourdes  
 Libraries: Main Branch  
 East Camden Branch  
 Kaighn Avenue Branch

Banks: Bank of New Jersey; Heritage Bank; United Jersey Bank  
 Education: Elementary-27 schools, 540 teachers  
 Secondary-7 schools, 600 teachers  
 Rutgers University  
 Camden County College Urban Center  
 Glassboro State College Urban Center  
 Highest Employers: Campbell Soup Company  
 RCA  
 Flexatallc Gasket  
 Garlock Industries  
 U.S. Gypsum  
 Classic Chemical  
 Monsanto Company  
 Langston  
 Flintkote  
 McAndrews and Forbes, Inc.





**CAMDEN WATERFRONT PARK**



## CAMDEN WATERFRONT PARK

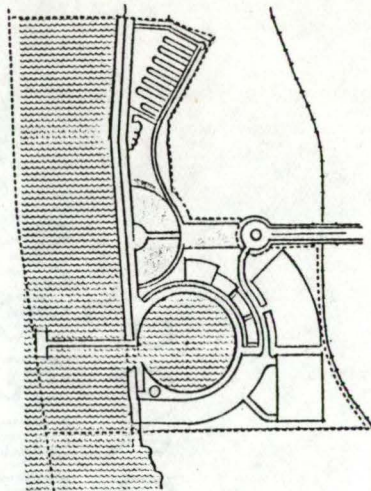
### Waterfront Park

The scope of the Waterfront Park is expected to be of a passive recreational type. Activity will focus upon the views across the Delaware River and the setting between the Benjamin Franklin Bridge and the piers of the South Jersey Port Corporation. In addition to passive recreation and the spectator reflection, the Waterfront Park will contain historic exhibits and an Interpretive Center and Park Administration facility. The theme of the facility will be the past and present significance of the Camden Waterfront in the region. The Park will be maintained by the Camden County Park Commission and serve the public need on a regional basis of access to the Delaware River.

### Phase 1

Constant activity along the river and the view of Philadelphia skyline are to be a predominate attraction along the Waterfront Park. The shoreline has been

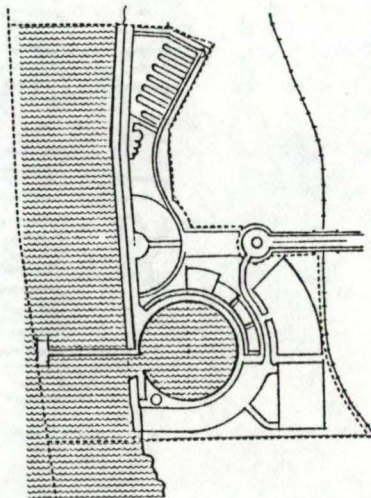




Waterfront Park Phase I

**Phase I—\$4 million**

Rough Grading & Seeding  
 Shore Protection  
 Shoreline Promenade  
 Plaza  
 Amphitheater  
 Partial Lighting  
 Partial Landscaping  
 Partial Utilities  
 Partial Site Furnishings



Waterfront Park Phase II

**Phase II—\$4 million**

Partial Stone Block Rip-  
 Rap  
 Harbor Excavation  
 Harbor Sheetpiling  
 Boat Ramp  
 Seeding

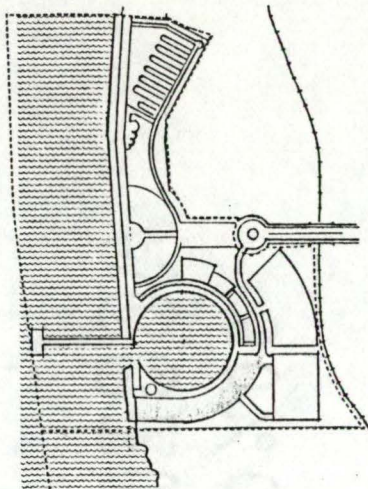
renewed and stabilized with large granite blocks as "rip-rap" with a 1:2 slope to provide a better bulkhead. Adjacent to the shoreline is a wide pedestrian promenade offering direct access to the water. Trees, benches and lighting provide necessary amenities to the shoreline.

At the west end of Mickle Boulevard is situated a grass amphitheater capable of accommodating 7,000 people. A stage area will be provided in the times of special events.

Phase one develops 7.78 acres with a 200-foot wide pedestrian promenade extending 1,400 feet along the Delaware River. Commemoration of the historic railyards along the waterfront will feature a Ferry and Railroad Museum.

At the south end of the promenade will be a new Harbor Basin. The Basin will maintain a capacity of up to 50 boats, 40 feet in length, a boat launch and a fuel pier.

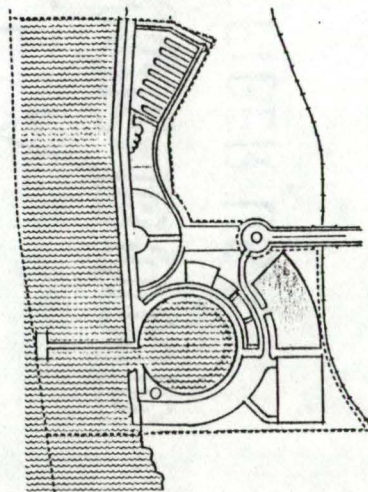




Waterfront Park Phase III

**Phase III—\$4 million**

Harbor Cap Stone  
Harbor Promenade  
Roadway  
Trailer Parking  
Harbor & Parking Lighting  
Partial Utilities



Waterfront Park Phase IV

**Phase IV—\$4 million**

Parking  
All Floating Docks  
All Landscaping  
All Utilities  
Final Grading & Seeding  
Upper Promenade  
Partial Administration  
Building  
All Site Furnishings

**Phase 2**

Phase two develops 9.47 acres providing a 50 to 150 boat slip harbor for public use. A 300-seat restaurant will overlook active maritime life on the Delaware River. A lighthouse will act as a focal point and a viewing platform for visitors.

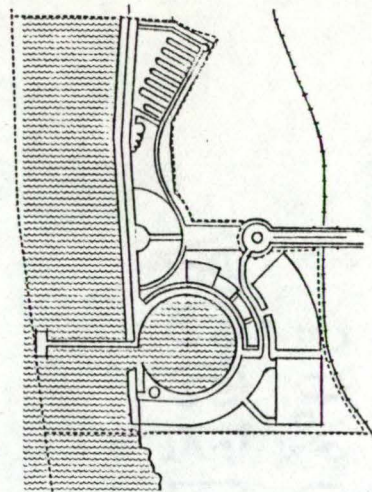
**Interpretive Center and Park Administration**

The Interpretive Center will be situated along the Harbor Basin and serve as a operating headquarters for the Park staff and an Information Center for visitors. The past and present significance of the Camden Waterfront will be the theme of the facility.

**Outdoor Ferry/Railroad Museum**

The display of authentic full-scale trains and ferries will provide recreational and educational purposes. The museum will relate to the public, the significance of the site, whose function for 300 years was the prime reason for Camden's location.





Waterfront Park Phase V

#### Phase V—\$4 million

All Administration &  
Harbor Buildings  
Fishing Pier  
Ferry/RR Area  
Lighthouse Tower  
Bikeway

#### Landscaped Areas

Frequent visitation by the local population in all age groups is expected. Space for passive, informal recreation such as picnics and unstructured play by small children will be permitted.

#### Restaurant

A privately-operated dining facility will be located in the Harbor Basin along the water's edge. The restaurant will serve as an amenity to the Waterfront Park. It will maintain seating for approximately 300 people along outdoor terraces.

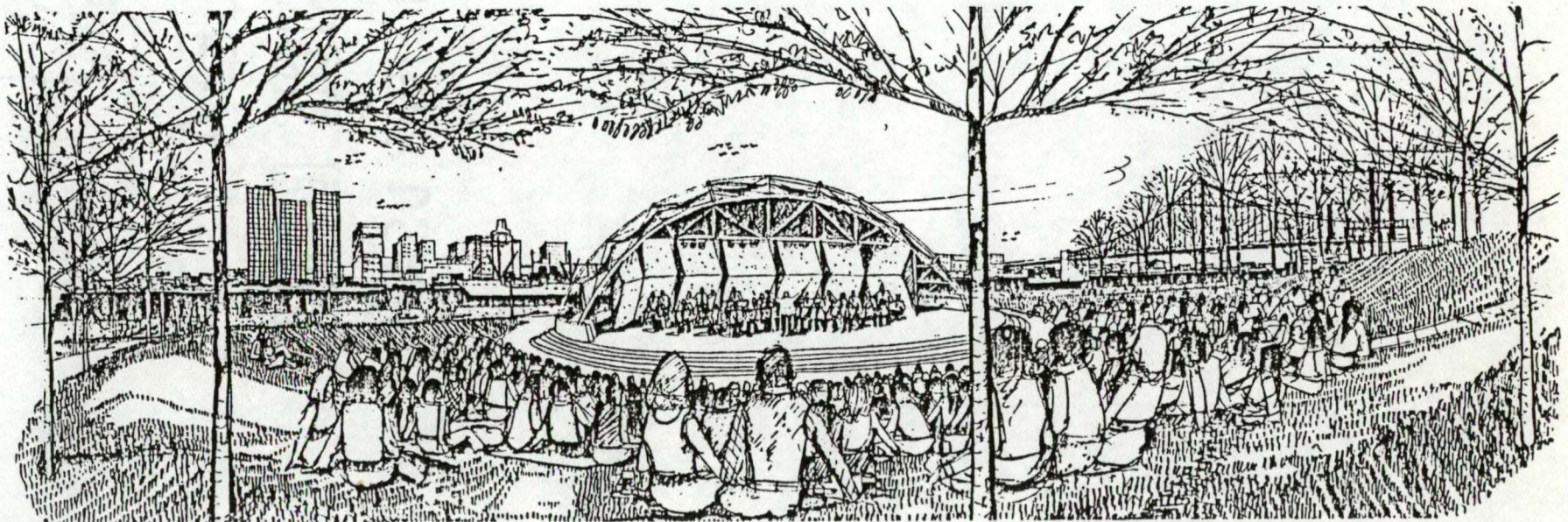
#### Parking

Surface parking is provided for the Park staff employees and Harbor Basin users who will bring boats on trailers to the launching site. Due to mass rapid and public transit serving the Park, minimal additional parking will be provided. If demand requires, a parking structure will be developed to minimize occupied land usage by cars.



### Access and Control

The formal entrance to the Waterfront Park is Mickle Boulevard. Secondary means of access will be provided by Federal Street, Delaware Avenue and the Harbor Basin area. These entrances are delegated for service, delivery and emergency routes.



**Proposed Amphitheater**



# **PLANNING PROPOSAL**



## PLANNING PROPOSAL

The City of Camden's Department of Community Development is responsible for promoting, planning and coordinating the publicly and privately-sponsored economic and physical development for downtown Camden and the city as an entity.

The prospectus for the Waterfront Site is in accord with the City Centre Urban Renewal Project which is the legislative basis for the site. The plan has been formulated in collaboration between the City of Camden, its Housing Authority acting as the renewal agency, The Greater Camden Movement acting for the civic and business community, Wallace, McHarg, Roberts, and Todd, consultants and the community.

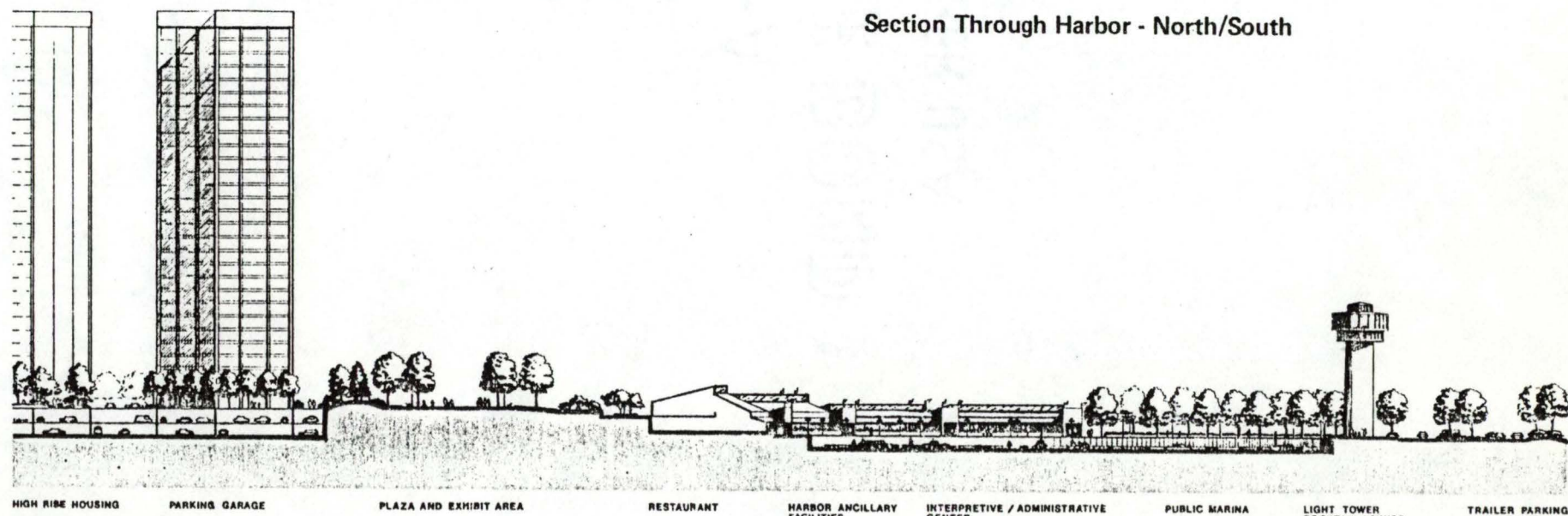
The plan incorporates density, open space, and building controls. The conjunction with the renewal project, the Housing Authority, City, and Camden County are responsible for site improvements.

Public commitments to the development of the Waterfront Site include the Camden County development of the 20-acre Waterfront Park, the City and Housing



Authority responsibility for extending Mickle Boulevard to the waterfront and building a four-lane bridge across the railroad, the City's arrangement for a 25-year tax abatement under the State of New Jersey's Fox-Lance Statute and the City's application for an Urban Development Action Grant from the federal government.

Section Through Harbor - North/South





**ZONING AND CODES**



## ZONING AND CODES

### Codes

The Camden Waterfront Site is zoned in accordance with the City Centre Urban Renewal Plan. The governing building code applicable to the city is the BOCA code. The Zoning Ordinance and other Codes of the City of Camden are to be applied to all parcels of land within the Renewal Plan. Any development not in agreement with the Renewal Plan must be presented to the Department of Community Development which will determine if the altered proposal meets the objectives and public health, safety and welfare of the City of Camden.



**ACTIVITIES**



## WATERFRONT MASTER DEVELOPMENT PLAN

### Social and Economic Objectives

Under the direction offered by the City of Camden, the objective of the Waterfront Site is to reverse the flow of population from the city to the suburban areas. The appeal of the Camden Waterfront is a direct counterpart of the social and economic mix of people that have made Philadelphia's Society Hill a success. The ultimate prospectus of the housing program is to provide a socially and economically balanced residential community within the feasible limits of market-rate housing, to add to Camden's tax base and to stimulate and encourage further development. The economic mix and tenure is to be based upon the market demand within the city's prospectus. The final product is subject to the approval of the Housing Authority and City.

### Design and Planning Objectives

Within the limits of the Waterfront Master Development Plan, guidelines have been set up to emphasize the principles of design and planning objectives consistent



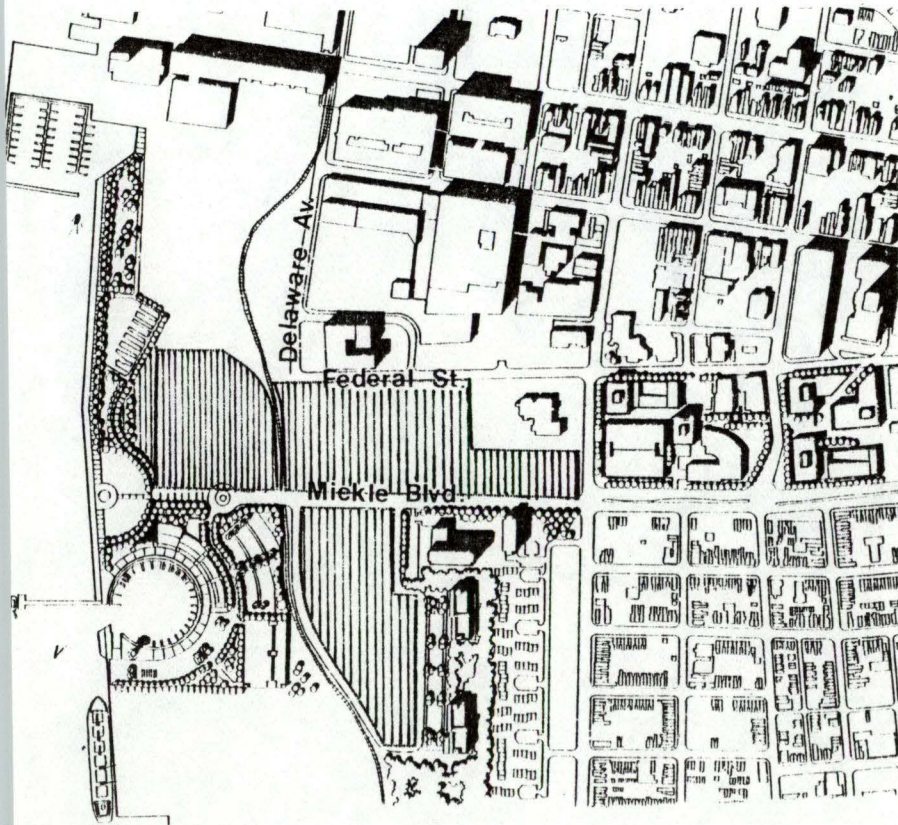
with the City Centre Urban Renewal Plan. These principles are set up as parameters as to the character and quality of the proposed development.

#### Intensity of Development

The highest overall intensity of development for good design, planning and market feasibility is needed. The entire Waterfront Site is designated to be developed as a single coherent community with proper treatment of landscape, street furniture, materials, colors, and pedestrian systems. They should enhance a creative, effective and unified community.

#### Circulation and Access

Primary access to the Waterfront Site is projected to be from Mickle Boulevard. Secondary access is available by Federal Street and Delaware Avenue. The secondary access is a grade-crossing at the railroad.





### Parking

Parking areas for high rise and garden apartments are to be provided in garages or under the principle structures either on the first level or below. Surface parking should be primarily for visitors and landscaped. Basic objectives are to provide parking under pedestrian decks or landscaped open space. Any enclosed parking facilities should be screened.

### Pedestrian Walkways

An internal pedestrian circulation plan is to be part of the overall design. The character should provide directness, clarity of image and security. An elevated pedestrian connection should be developed across the railroad from Parcel A to adjacent sites.

### Off Street Loading

Off street loading facilities for residential use is to be provided within the interior of the structures whenever possible. Above grade loading should be screened from public view to eliminate unsightliness.



### Utilities

All necessary utilities are available to the Water-front Site along either Mickle Boulevard, Clinton Street, Federal Street and Third Street.

### Open Space and Recreation

A minimum of thirty percent of the residential site area shall be used for open space, plazas, parks, gardens, pools, walkways and landscaping.



# **ARCHITECTURAL PROGRAM**





## PHYSICAL PROGRAM

### User Profile

The demand for housing at the Waterfront Site is not expected to contain a large population under eighteen years of age. For those people who have school-age children, the nearest elementary school is the Bergen-Lanning School along Fifth Street and Berkeley Street. At 15 North Seventh Street is the Center City Catholic School within four blocks of the waterfront. It accommodates children in the first through eighth grades.

The residential areas within the city business core is expected to attract a larger adult population. Accommodations must be met for the singles, unrelated and unmarried couples and elderly employed by the central business district.

The interest in the eyes of the City of Camden and its Housing Authority emphasize upon the development, a product that insures the maximum practicable scale and quality in accordance with the outlined specifications in the City Centre Urban Renewal Plan.



Development should provide a marketable rate housing for sale and/or rent in accordance with the economic objectives in the program. Emphasis shall be placed upon the individual dwelling unit and the interjecting factors of security, accessibility, landscaping and controlled parking. Within the range of the previously mentioned factors and the city zoning, the new urban housing will become more internally oriented. The interior orientation will necessitate a need for individual identity on a human scale and a clarity of image to its user.

#### Physical Program

The City of Camden has adopted suggested building regulations and control for areas within the city boundaries as pointed out in their Renewal Plan.

Some of these standards are as follows:

- a) Maximum site coverage for residential building usage of either the high rise or garden type shall be fifty percent.



- b) Any commercial services will be located on the ground floor in mixed usage capacities.
- c) Maximum building heights shall be 325 feet for high rise construction, 40 feet for garden apartments, and 30 feet for townhouse construction.
- d) Maximum of 100 dwelling units per acre of the site on Parcel A regardless of the housing types.
- e) A maximum of 30 dwelling units per acre will regulate Parcels B, C, and D.

#### Site Statistics

A minimum of thirty percent of the residential site shall be used for open space, plazas, parks, gardens, pools, walkways and other landscaping.

The Total Area of Site A - 6.2 acres

- 272,800 square feet

Open Space Available at 30% - 81,840 square feet

Maximum Building Coverage

According to Codes is 50% - 136,400 square feet



### Unit Type

The principal owner of the dwelling unit is to be a single person or couples with some interest in small family units made up of fewer rooms than a typically oriented family unit without neglect of the actual unit size. Garden apartment units will contain open space in the form of a court or roof terrace with proper consideration for the solar orientation of the unit.

One Bedroom Units - 35%

Two Bedroom Units - 45%

Three Bedroom Units - 15%

### Program Requirements

Dwelling Units - 620 maximum

Parking Spaces - 930 (ratio  $1\frac{1}{2}$  car/1 D.U.)

Park and Open Area - 81,840 square feet



# **MARKETING PROJECTIONS**



## MARKETING PROJECTIONS

### Marketability

The marketing projections for the Camden Waterfront Site is expected to be similar in demand character as associated with Society Hill Towers in Philadelphia. The Department of Community Development in Camden is the coordinating element that will control the apartment units to be offered, the achievable rent and the turnover rate.

In general, waterfront real estate is a relatively limited commodity which typically demands premium prices. Usable waterfront site, when not adversely affected by industry, with water suitable for boating enhances the premium.<sup>1</sup> The initial development of waterfront property normally contains a high featureable cost.

River and harbor development is perceived by a benefit/cost ratio. The relation of the dollar value of the encouraged activities to the required dollar amount for facilities is the optimum indicator.<sup>2</sup> Fortunately, federal, state and local funds can be utilized along



with private investment. Federal funds can be recommended by the Corps of Engineers for flood and river control, breakwaters and commercial waterways where there exists a favorable benefit/cost ratio. State and local bond issues and capital outlays can provide funds for recreational harbor and shoreline development. Private enterprise then can proceed to develop waterfront facilities.

In a closer view of the results over the near twenty year longevity of Society Hill Towers one might gain insight of the future for Camden's waterfront housing market. Through the achievement of greater attractions to the area, costs quickly escalated in apartment rents over fifty percent. The socioeconomic profile of the area became a relatively expensive suburb. The area witnessed a virtual expulsion of the small businessman and the less-than-middle-income family or singles. Instead, the Towers attracted more career oriented people and young college graduates.

# **POPULATION PROJECTIONS**

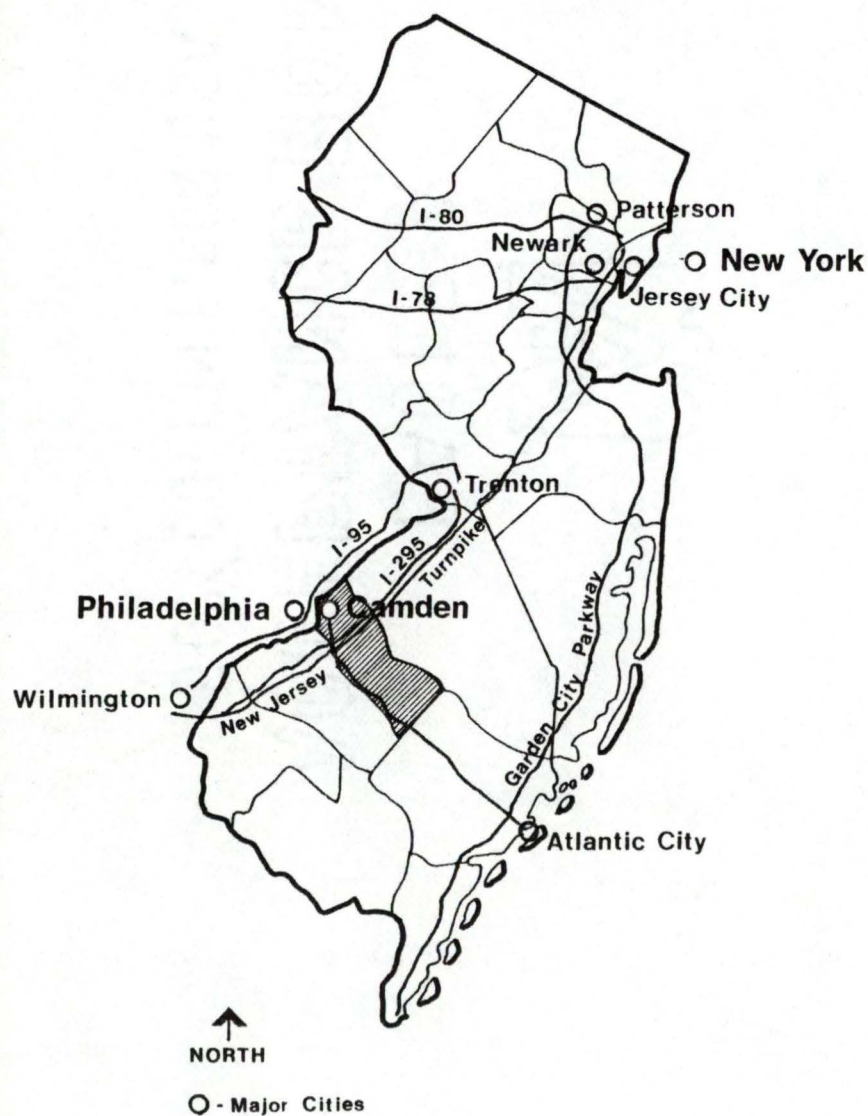


## THE STATE OF NEW JERSEY

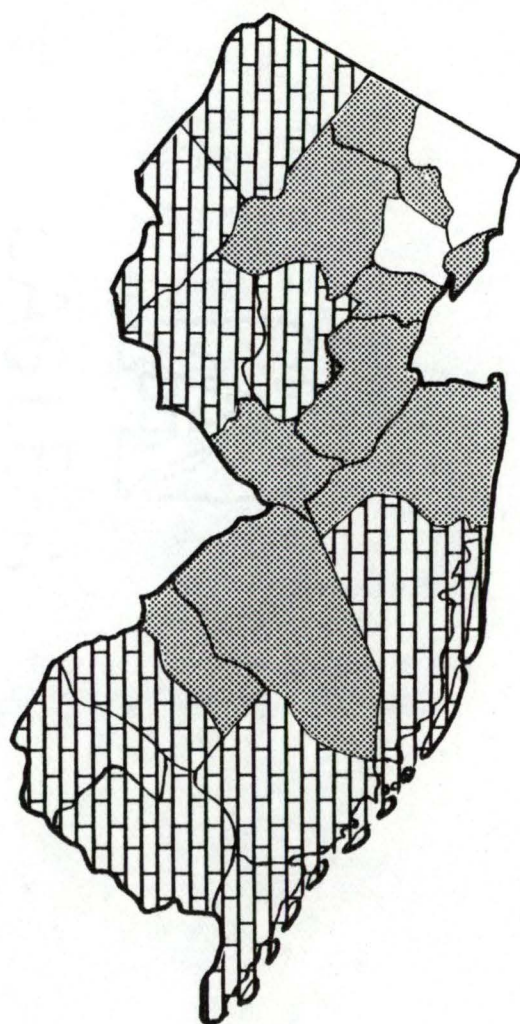
### POPULATION PROJECTIONS

New Jersey's population has been concentrated in the northern part of the state, particularly the north-eastern sector due to the accessibility to New York City. Resultant percentages of the 1970 population estimate projected that nearly 50% of the total population was contained in the upper northern counties. Nevertheless the population development in New Jersey has followed a southwest-northeast corridor between Philadelphia and New York City.

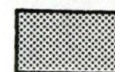
The projected growth rate on a state-wide basis indicates a population spread to more rural and suburban areas. The southwest sector of the Philadelphia-New York corridor containing Camden County is expected to continually grow in population density. The instituting of legalized gambling in Atlantic City has reopened the east-west corridor to the Philadelphia-Camden area. Camden County and the City offer the best proximity along this route for most personal and regional commodities.



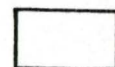
## STATE POPULATION DISTRIBUTION



LESS THAN 4 PERCENT



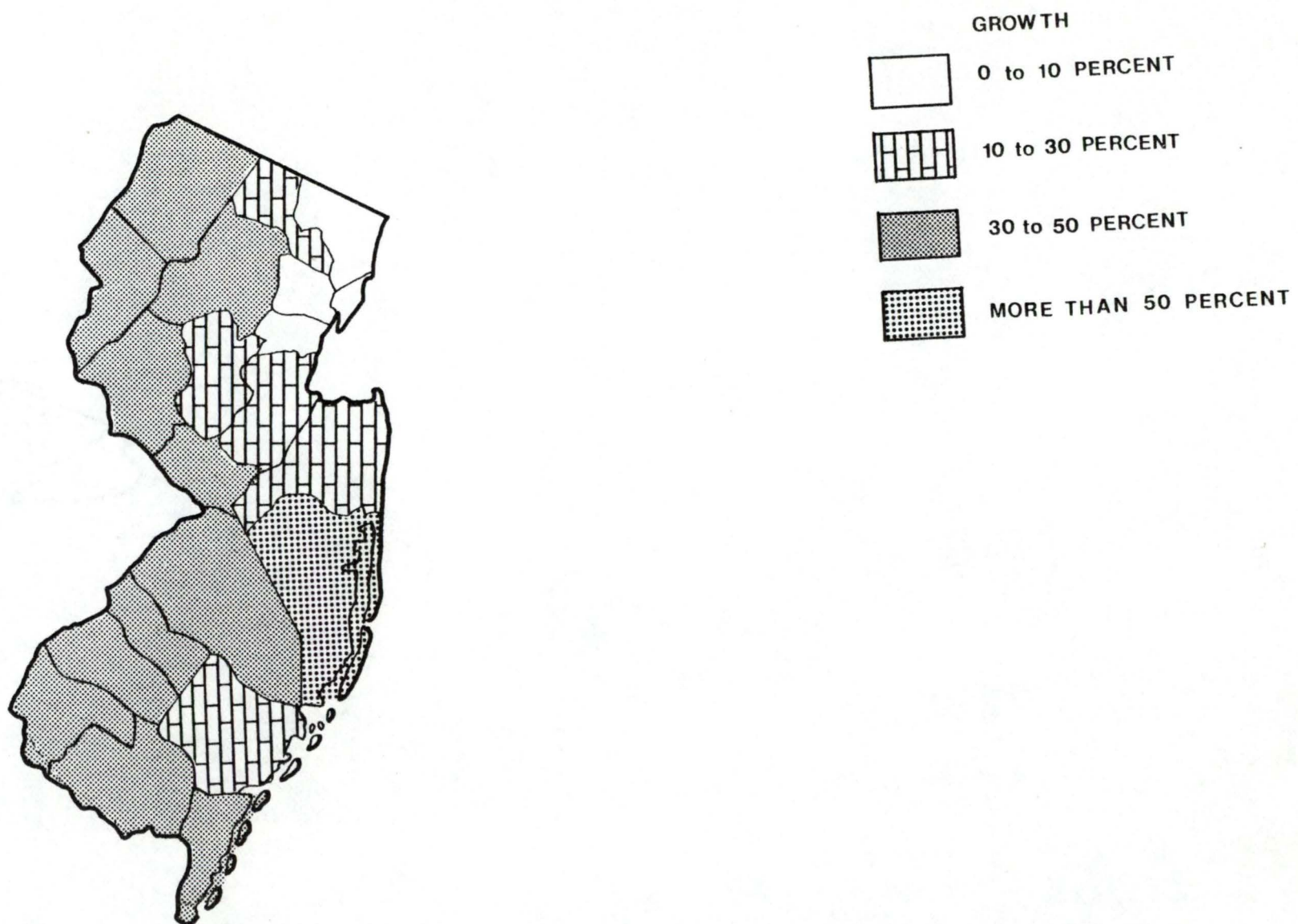
4 to 9 PERCENT



MORE THAN 9 PERCENT



## YEAR 2000\* POPULATION PROJECTIONS

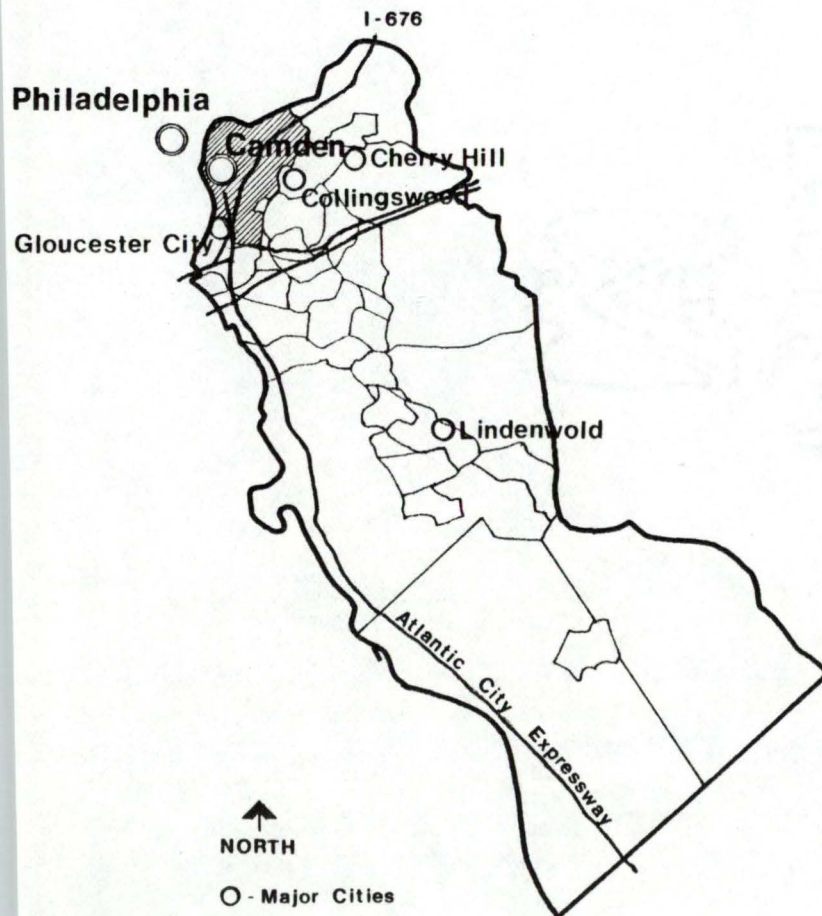


## CAMDEN COUNTY

### POPULATION PROJECTIONS

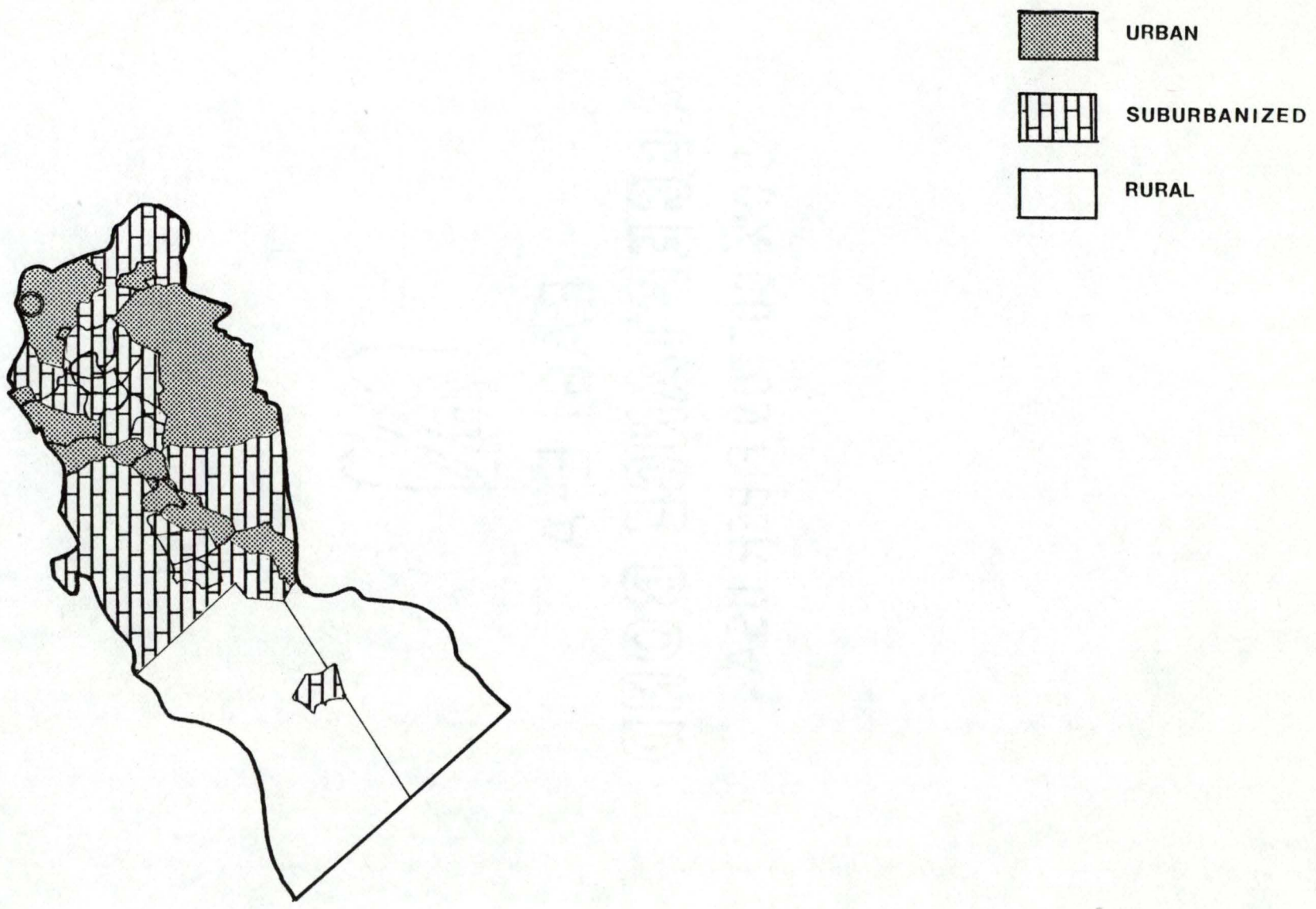
The City of Camden represents approximately 22% of the county population. It presently exceeds the critical density urban classification. This excessive density was due to the rapid growth the city had experienced between 1950 and 1970 like most large industrialized cities.

The projected population for Camden is expected to decline to almost 16% of the county population. Rural and suburban areas with greater appeal have aided in causing the center city area to decay. This trend of migration is what the city administration would prefer to alter by revitalizing the central core. The expected load of responsibility designating Camden as the governmental center of southern New Jersey and the energy situation should add to recreating the need for housing and a distinct population increase within the city limits.

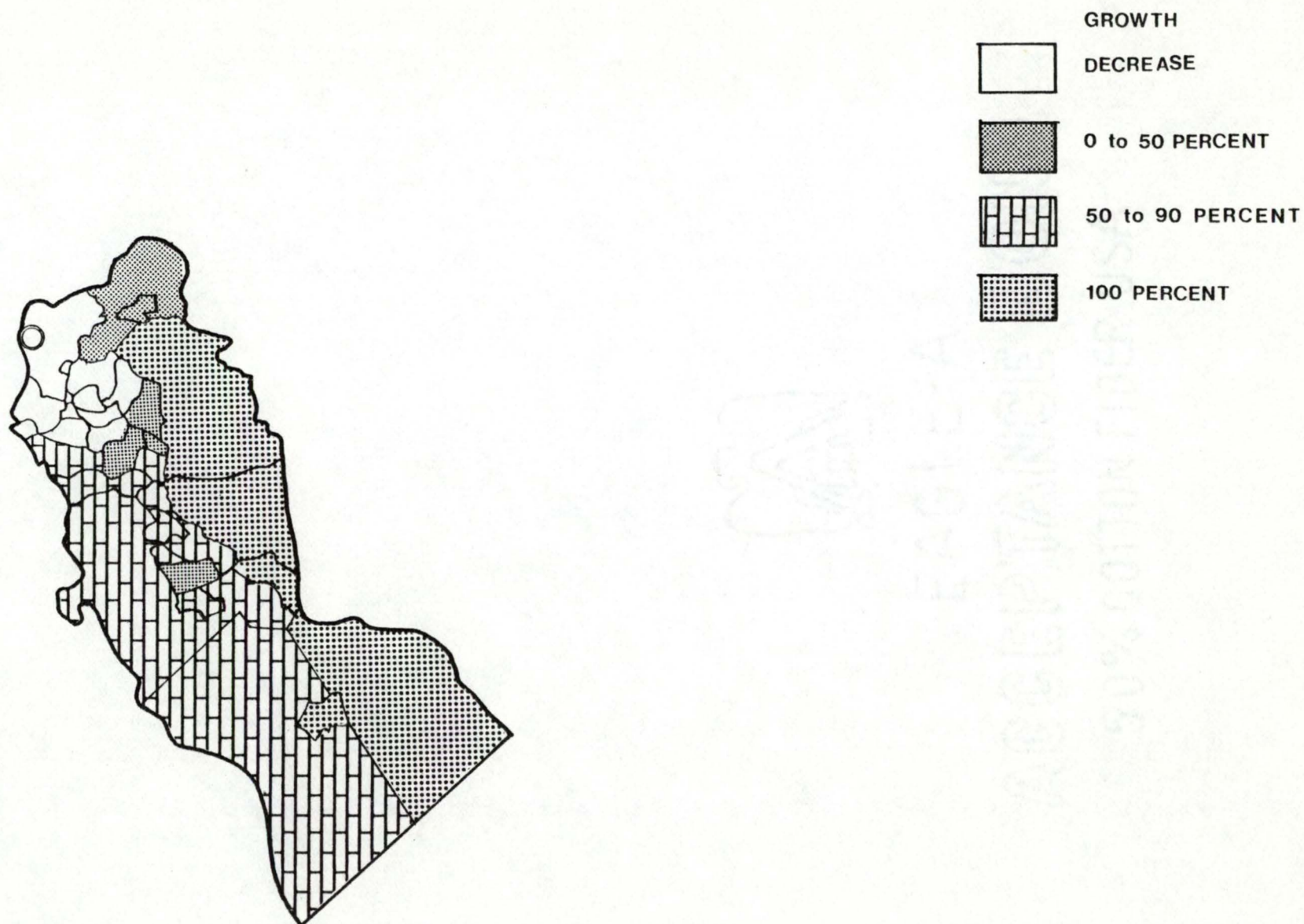




# CAMDEN COUNTY POPULATION DISTRIBUTION



# YEAR 2000 : COUNTY POPULATION PROJECTIONS





**URBAN WATERFRONT LANDS**

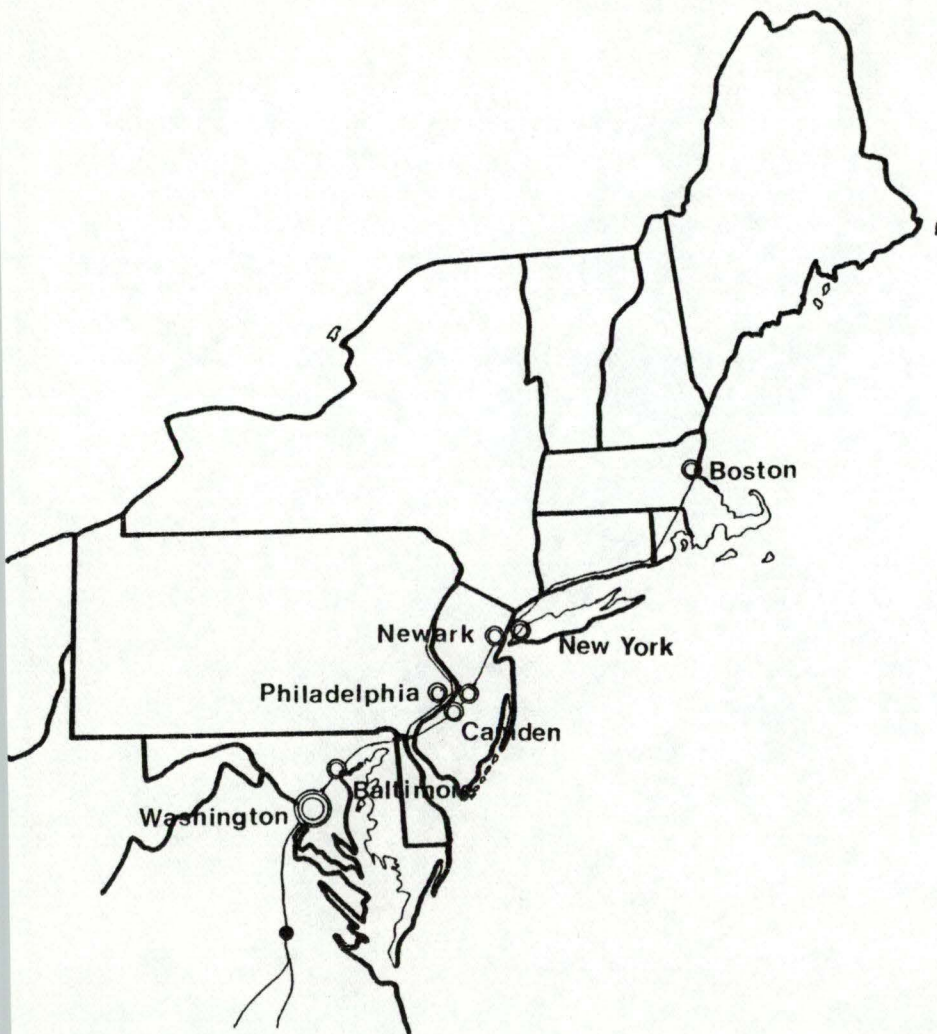


## URBAN WATERFRONT LANDS

### Overview

Urban waterfronts are a special class of natural resource. They possess a diversified social opportunity for economic development, public enjoyment and civic identity. Changing technologies in the use of air, land and waterborne transportation, and impending concerns for environmental quality have renewed interests in the urban waterfront.<sup>3</sup>

More often, the urban waterfront results in a conflict between population and commerce. However, advanced technological systems of cargo handling, and the steady decrease in waterway passenger travel has left a large sector of urban waterfront land to decline in development. The effective reuse of waterfront sites or their redevelopment for economical reasons and for recreational and cultural purposes has offered a varying challenge to planners and architects for each waterfront adaptation.





### Hazards to Urban Waterfront Populations

The concentration of residential populations, commercial activities and industrial facilities along urban waterfront land can be heavily afflicted from storm driven floods. What applies to the coastal regions concerning protection by flood control structures, or limitations on land use is quite similar in modified terms for urban land within river flood plains. Prevention of loss of life by warning and evacuation, rather than by insuring the land use on waterfronts does not exacerbate the potential risk, seems to be the prevalent response to this problem.<sup>4</sup>

Man-made hazards have resulted in more stringent regulations of liquified energy gas marine terminals, toxic chemical storage and processing facilities on the waterfront. Transportation by truck or rail of hazardous materials from waterfront facilities has enlarged the affected population and led to the demand for banning these movements through the urban core and residential zones to insure public health.<sup>5</sup>

### Recreational and Cultural Uses of Waterfronts

Growing national interests in environmental quality, recreation, cultural programs and historic preservation coincides with our rapid technological maturity. These factors have created a greater desirability of cities as a place to live. Rising public interests has been backed by federal, state and local legislation designed to enhance the quality of the waterfront as a physical resource.

There are two important design concerns in providing waterfront land for recreation: providing access to the waterfront and providing sites and facilities to support recreational activity.

Aside from recreational use, historic preservation programs have created a stimulus for the waterfront adaptive reuse of old buildings and docks. New innovations for historic buildings and piers can compliment the waterfront.

The pressure for recreational use, cultural enjoyment and historic preservation of city waterfronts



is expected to continue. The diversification and numbers of people are expected to increase along the waterfront as the attraction surmounts. The success of planned events, such as festivals and exhibits, as well as the popularity of many less ambitious, more informal activities will become a reflection on the urban cultural pattern and its demand upon the waterfront resource.

#### Urban Waterfront Revitalization

In considering the redevelopment of the city waterfront, the main points that must be made are:<sup>6</sup>

- 1) The city is a special place in the mind of its inhabitants.
- 2) The waterfront is a special place in the context of the city.
- 3) The citizens' hopes and plans for their city and its waterfront are critical elements in land-use decision making.

One of the leading factors that separates the riverfront cause from the others is the physical

appeal of the location itself. In the built-up environment of a city, the presence of water is an attraction. Riverfronts are not just local in scope; they are regional places that link cities together.<sup>7</sup>

### Safety and Health Issues

The main concern of the public at large is safety and health. These issues command the greatest amount of attention due to urban effect resulting from fire, vandalism and pollution. Improper control of impending issues will result in a decrease in interest by the users.



**BACKGROUND BUILDING TYPE**

## BUILDING TYPE BACKGROUND

Throughout history, the shape of cities has been strongly influenced by the habits and the preferences in housing.<sup>8</sup> The relationship between housing and the making of a neighborhood along with interrelation of urban activities has determined the quality and character of city life.

While the neighborhood atmosphere has perpetuated, the essence of the house was a means by which the owner created his own individuality. The physical form of the dwelling unit depicts the individual's desires, values, aspirations and cultural background. The form of housing must consider these general desires and ambitions of its user group. It should provide the flexibility necessary for individual identity.

During the first 150 years, urban housing in the United States consisted almost entirely of free standing single dwellings on individual lots. They were usually placed in a pattern upon a grid plan, a principle dated back as far as ancient Greece. In



Colonial New England, the pattern was composed of two-story wood-sided houses. This house form complimented by the elements of trees and a definite sidewalk created a pattern which produced great livability and low density. The straight forward grid plan was appropriate for its pragmatism and expandability.

American housing patterns became more dense and urban in the 19th Century. The great population growth in major cities coupled with the flourishing of commerce and industry produced the first urban streetscapes. The row house became the first and most notable expression of urbanization. In Baltimore, Philadelphia, New York and Boston, the urban character was shaped by tall row houses of masonry construction with elaborate cornices, sharply defined windows and distinctive entrances. The grid plan organized their development while the row house block became a city building system.

The fixed set of elements as those depicted in the colonial system, fit together according to



particular rules to form whole blocks and neighborhoods. The dwelling unit gave definition to the streetscape by forming walls along the access corridor. Their forms were seemingly rigid, yet extremely variable, capable of producing environments of specific character and flavor according to its architectural embellishments.

The row house system became a quantum jump in urban life. The common wall construction and proximity to the street increased the privacy in the rear garden while accentuating the public nature of the front facade. A projecting entry stair produced an intermediate zone between the private and public, offering a reduced version of the front yard. The sidewalk became an extension of the house.

The row house system allowed the grid plan to be fully exploited. It allows for buildability in small or large groups and expandability in any direction according to the available land. While several modern developments built adjacent to one another would not necessarily make a coherent pattern, row house



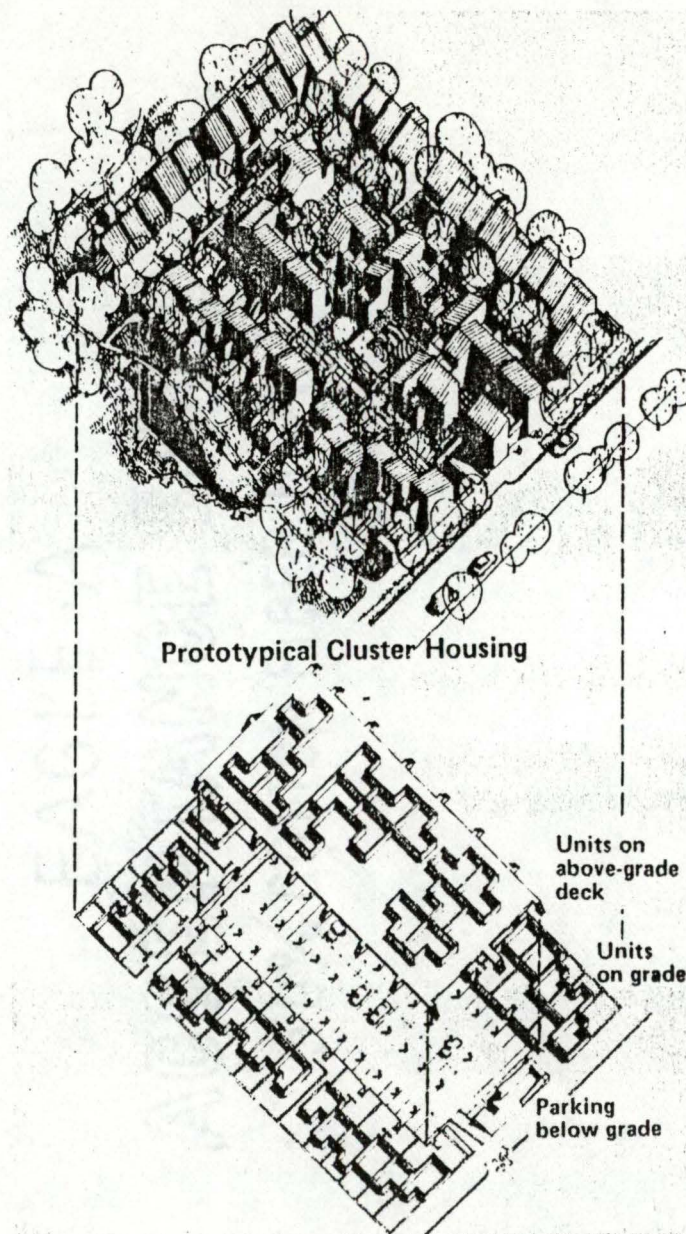
developments merge together relying upon their architectural details to make neighborhood variation.

Row house systems did not become a universal model of its time and place. Its development was common only in major commercial cities and housed the more successful gentry. However, the system was invaluable for producing places of vitality, appropriate scale, sufficient density and considerable variety amalgamating into a fine human response.

### Cluster Housing

The concept advocated by cluster housing induces the idea of a "garden city" offering a propensity for single family housing and a rural orientation. It introduces an anti-urban sentiment and is perceived as being self-contained and self-supporting. Cluster housing seeks to contain the growth of a big metropolis by placing a big green-belt between new communities and the city. Cluster housing concepts enable developers to create large expanses of open space rather than an individual lot.





The advantages of this form of housing stems from its flexibility in the density of its dwelling unit capacity, and the cost savings it can produce due to the use of a smaller road and utility network.

"Reduction in cleared land as well as planning for communal amenities not otherwise affordable by individual households has resulted in a high degree of user satisfaction with cluster housing." 9

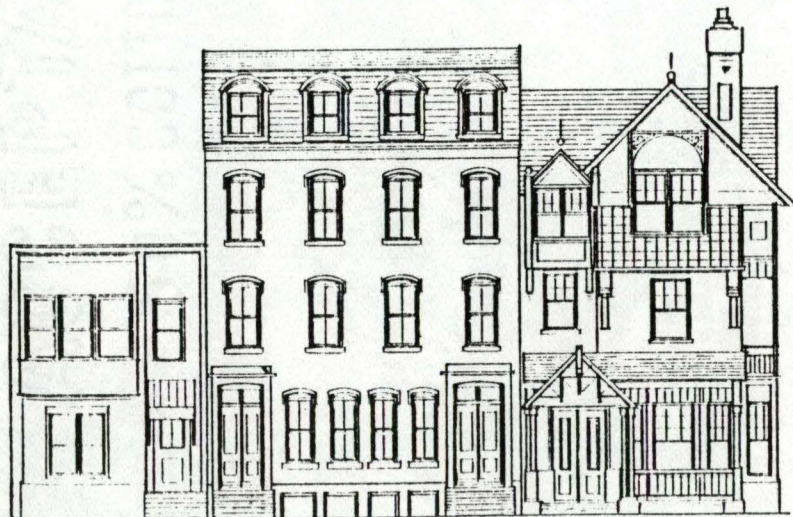
The strength of the cluster housing concept is that the single family house and its domain may still be distinguishable at increased densities. It offers immediate ground contact and automobile access. In addition, the housing efficiency by the sharing of walls reduces the amount of material used and the energy consumption.

Reduced privacy often causes the development of private outdoor space to become an internalized court. The internalized court allows light and air into dwelling units which no longer have a four-sided exposure due to the clustering.



The form of cluster housing generally initiates a relatively sparse land use. Its appeal stems from the issues of individual access, potential for identity, ground relatedness and landscaping at densities of twice or three times greater than those of single family house developments. The courtyard type of development used in cluster housing has often been made up of row house units.





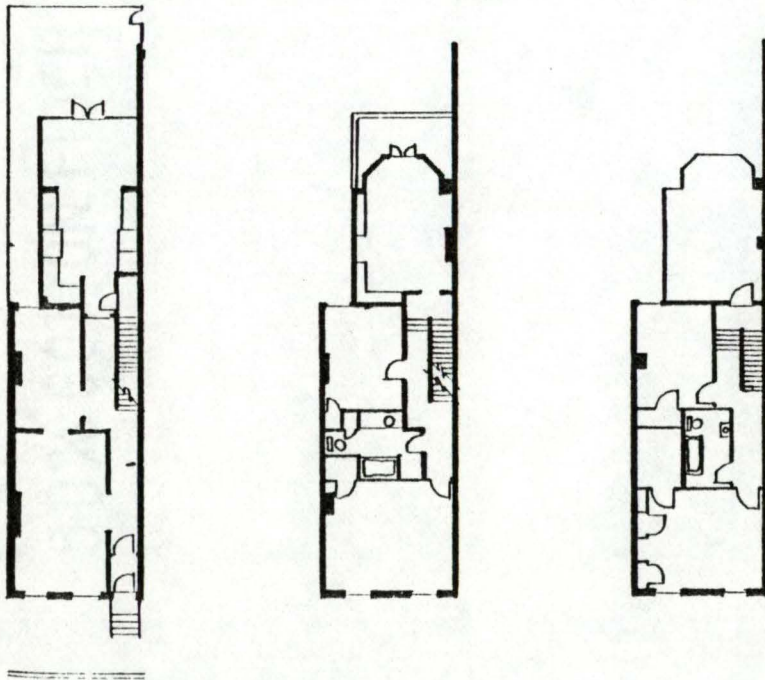
### Row House

The row house was originally developed in Britain around 1600. It offers the major aspects of a single family residence: a front and back, a transitional set of spaces and a well-zoned two or three story house. The conventional siting of row houses has been street oriented. It traditionally creates a strong consistent public side displaying an individual household identity.

Row house development places a major emphasis upon the determinants of security, supervision and vehicular access. Consequently, they have become more internally oriented toward the center of the block to create more controlled access, outdoor areas removed from the city street and more secure open parking. In the street oriented model of row housing, the individual user parking is often incorporated into the lower levels of the units. If aggregated parking is necessary, it is often placed under a group of dwellings in an internally sited scheme with private yards or a common courtyard placed on a deck above.



Developers began using the row house around 1800 due to its economic advantage and the rapidity of its construction. Moderate to high densities were easily reached and marketing was simplified. Their relatively inexpensive nature often reduced the potential for identifying the individual dwelling; however, they provided good interior flexibility. In most instances, a private garden provided an additional advantage to the individual owner



TYPICAL 1860'S ROW HOUSE

### Mixed Housing Form

Mixed housing forms offer a greater achievable density to housing neighborhoods. Their density usually produces 75 to 150 dwelling units per acre. Cities are mixed use places by definition and the availability of housing varieties produces a marketing advantage.

The importance of the spatial outdoor variety is a decisive factor in accommodating the different user groups. New housing must relate to its context, and at the same time represent an aggregation of dwellings with which the resident can identify.<sup>10</sup> The site massing becomes critical to the response of the existing context and for establishing either a varied ground plane or protected semi-public spaces. In mixed housing forms it is necessary to define and protect the semi-public spaces.

The incorporation of a high rise element can take two approaches: first, the combination of producing a perimeter block and a tower or second, free-standing tower elements and walk-up buildings. In each case,



the lower elements are generally facing street activities in order to meet the existing scale. A third type is conceivable coalescing the two forms previously mentioned thus producing a stepped building form where the low rise and tower connect into a single continuous network. The advantages of the former solutions are far greater for their internal security.

The common controversy of the mixed use housing form becomes the nature of the project in producing the vernacular versus the monumental. No matter what choice evolves, the necessary density becomes a requirement and the impact of human scale a key factor to the project's success.



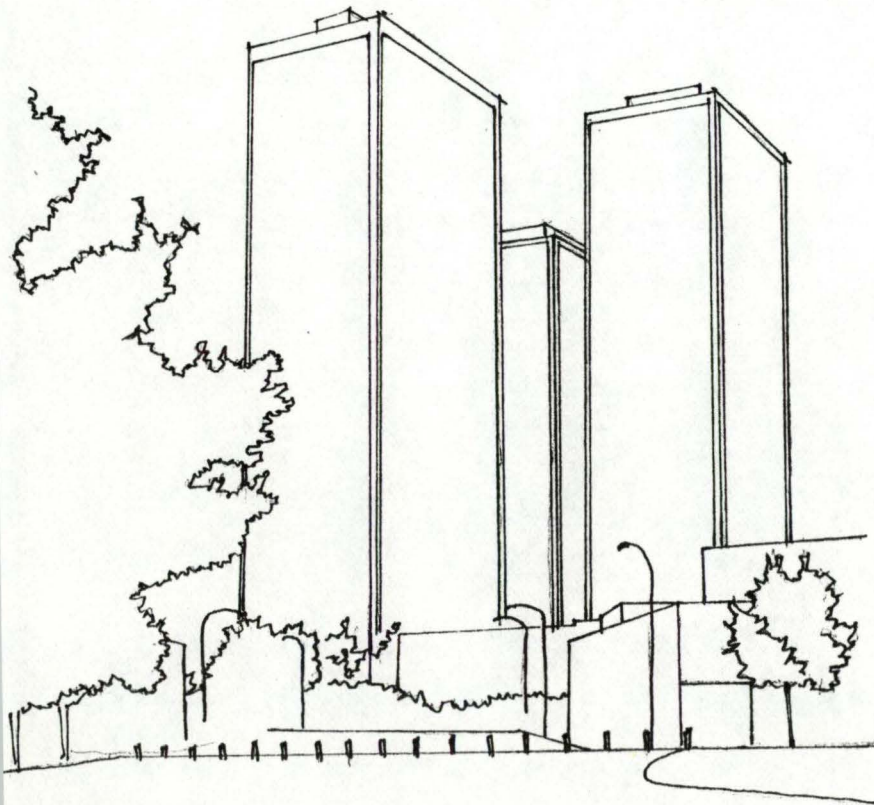
**CASE STUDIES**



PHILADELPHIA SOCIETY HILL TOWERS 1963  
 Philadelphia, Pennsylvania  
 Architect: I. M. Pei  
 Client: William Zeckendorf, Jr., General Property, Inc.

Philadelphia's Society Hill Towers was the mark for the beginning of the redevelopment of Washington Square East. The area, originally inhabited by the food distributors and the poor of the city, has recreated to become one of the most successful high rise developments in city planning. Its zoning stemmed from the Philadelphia City Planning Commission's innovative plan, headed by Edmund Bacon, to restore the community to a pedestrian environment, and an economical resurgence to return the suburban people back to the city.

The design of the three, 32-story towers marks a punctual end to the historical area. The use of material, color, texture, and the "greenway" system of pedestrian footways has integrated the structures to the scale of the community and a distinct pattern of urbanity. The towers are placed upon the high point of the site and have evolved as the symbol for the entire neighborhood. They are a major design



departure from the typical high rise construction introducing the emphasis upon the tower rather than the slab. Their careful positioning takes advantage of the street vistas created in the city's grid plan. At the same time, the towers offer a frame to other visual corridors. The parking has been tucked away out of sight beneath the towers and formal access plaza.

Society Hill Towers were the first, after New York's Kips Bay Plaza, to offer a fully glazed exterior in place of the old sill-high windows punched in a masonry wall. It incorporates a cast-in-place load bearing concrete screen wall based upon an economically repetitive forming system.

The success of the towers can be seen through its marketing rates. Over the past fifteen years their value has more than doubled and maintained near one hundred percent occupancy after a sluggish start. It creates a heart for the community of a solid upper-middle-class-income value.



PENN'S LANDING SQUARE 1976  
Philadelphia, Pennsylvania  
Architect: Louis Sauer Associates  
Client: 91338 Corporation (developer)

The program of the Penn's Landing Square project needed to create within a one city block area in the historic setting of Philadelphia's Society Hill, a maximum economical housing development of a density of fifty units per acre. The height of the housing form was restricted to three-story construction while a garden or outdoor deck was strongly recommended for most apartments. The units are a combination of townhouse condominium and garden apartments.

The design of Penn's Landing Square seeks to attempt a transition between the high rise towers of Society Hill and the 18th and 19th Century houses on an adjacent site. The units, which consist of clustered one to four bedroom apartments, are distributed throughout a landscaped courtyard and connected to ring the perimeter of the city block. Entrance to the site is permitted at only three positions adding to the overall security and privacy of the housing

development. To increase the sense of privacy, each apartment has its own private entrance. In addition, there are no lobbies, public stairways, shared corridors, or common interior spaces. The marketing of the project was to attract a middle income client away from the suburban areas.

Construction of the eighteen townhouses and eighty-five garden apartments is masonry bearing walls of brick, in order to harmonize with the historical area. The economy of its construction is its most outstanding asset along with its security response. Parking is provided in an underground lot for the residents.

The design of the apartments is very sensitive to its users. Scale became an important design factor for the complex to hold its place in context with the historical essence at one facade to the dramatic change of Society Hill and the towers on the opposing facade. Its appeal has allowed the unit value to increase significantly, thus emphasizing its success in concept and form.



EASTWOOD, ROOSEVELT ISLAND 1974  
 New York, New York  
 Architect: Sert, Jackson and Associates  
 Client: New York State Urban Development Corporation

The Eastwood, Roosevelt Island development is a mini-community of apartments, shops, schools and social services clustered in three adjacent groups around three open courtyards. It is an experiment in residential design environment for 1,000 families. The project is located in New York City's East River area between the boroughs of Manhattan and Queens.

The design of the entire complex as a comprehensive community offers a high density environment with a feeling of openness, seldom obtained in an urban setting. Part of its many design parameters was the attitudes towards the safety of children, and the offering of high density communities, complimented by the trees and grass areas commonly associated with the suburbanial areas. The complex seeks a humane and personal response from its users.

Each of the three courtyards contains a one- or two-story building to break down the scale of the





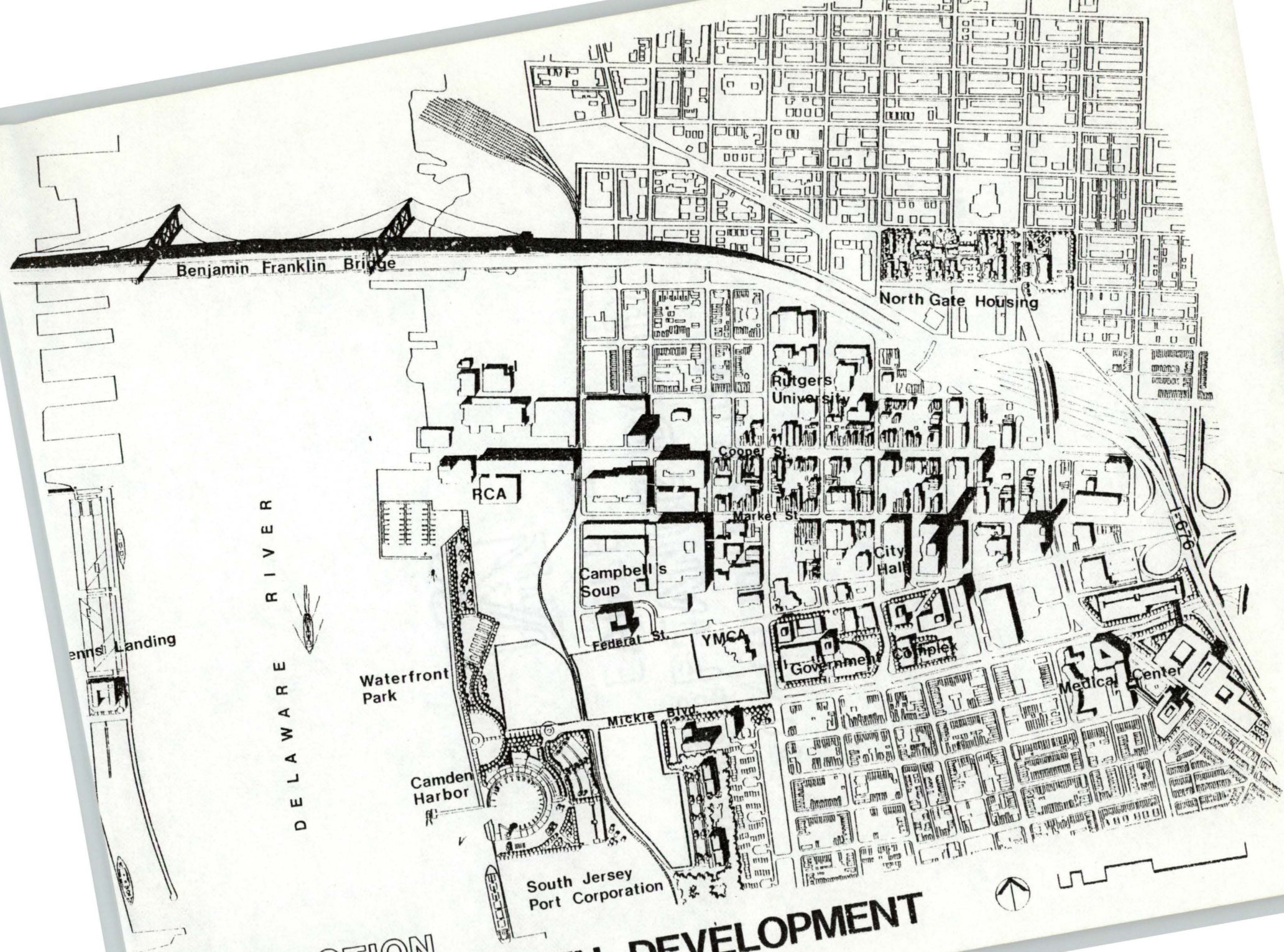
apartment units. The mass is further reduced by the step down buildings from a twenty story tower fronting the Main Street to six stories along the river edge promenade. The courtyards contain the support functions of a school, a daycare center and a group of shops backed by an amphitheater to compose the total community feeling.

Construction of the complex is emphasized in brick endorsing the feeling of human scale. Each living room of the apartment unit is projected slightly to break up the long stretches of wall. Horizontal bands of windows emphasize the level divisions and provide riverfront views and an abundance of light, lending them a feeling of security. Design features include the skip-stop elevator concept more commonly found in European developments, marked point towers and the use of a varying ground plane to move people through the courts more comfortably. The concept is a unique approach to urban community development as a self-contained environment.



**SITE ANALYSIS**

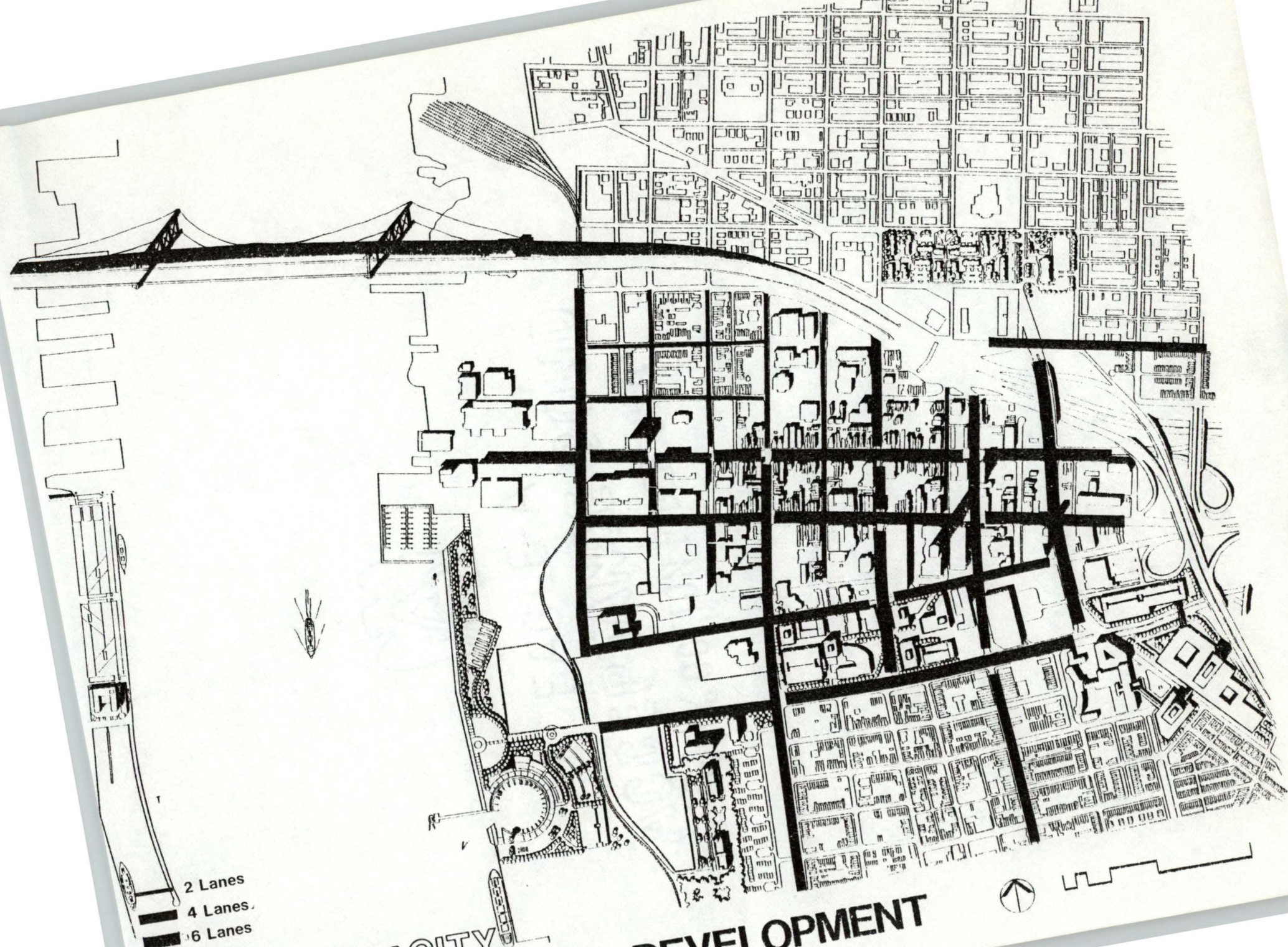




INTRODUCTION  
DOWNTOWN

CAMDEN DEVELOPMENT



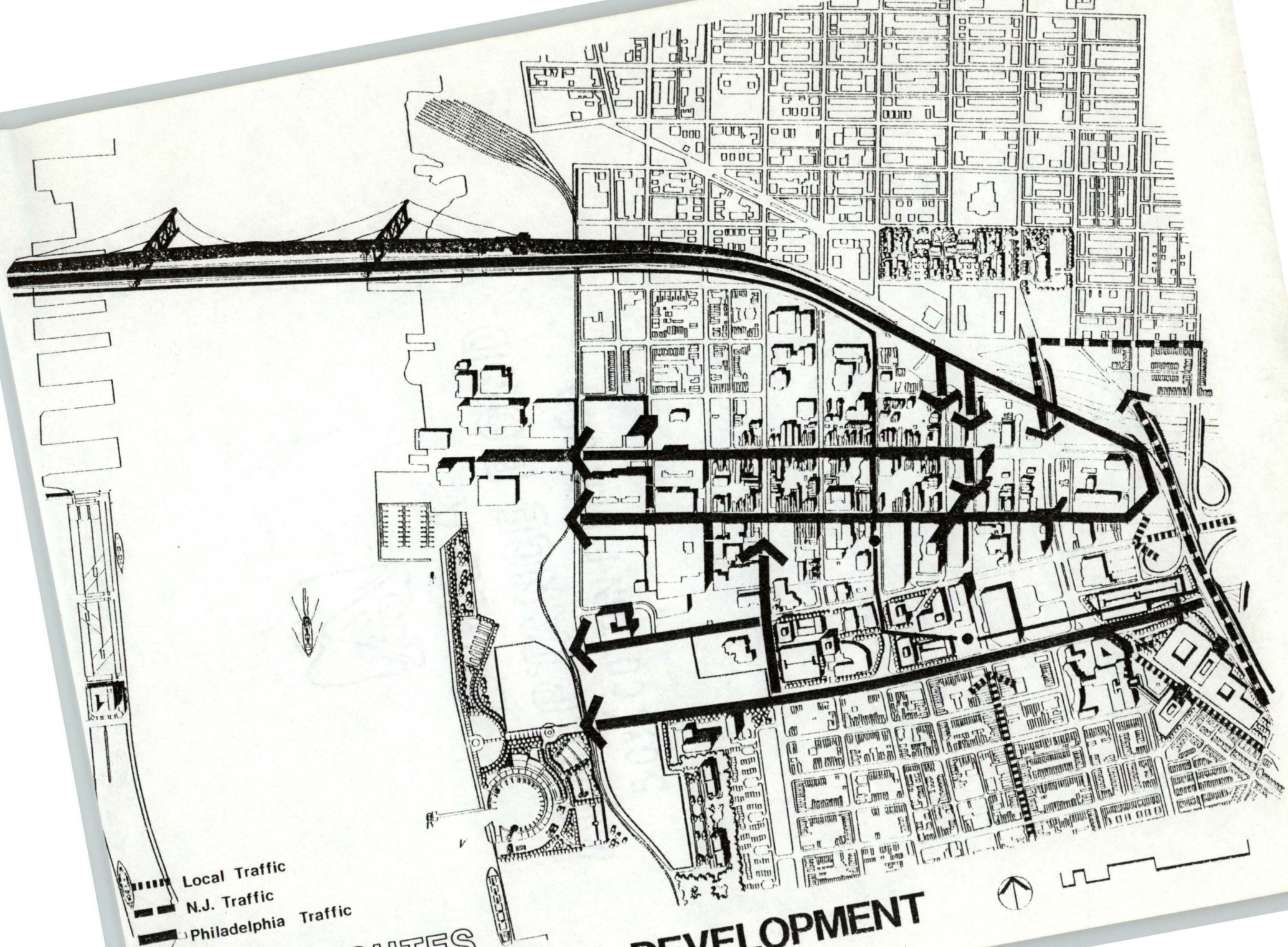


2 Lanes  
4 Lanes  
6 Lanes

# STREET CAPACITY DOWNTOWN CAMDEN DEVELOPMENT



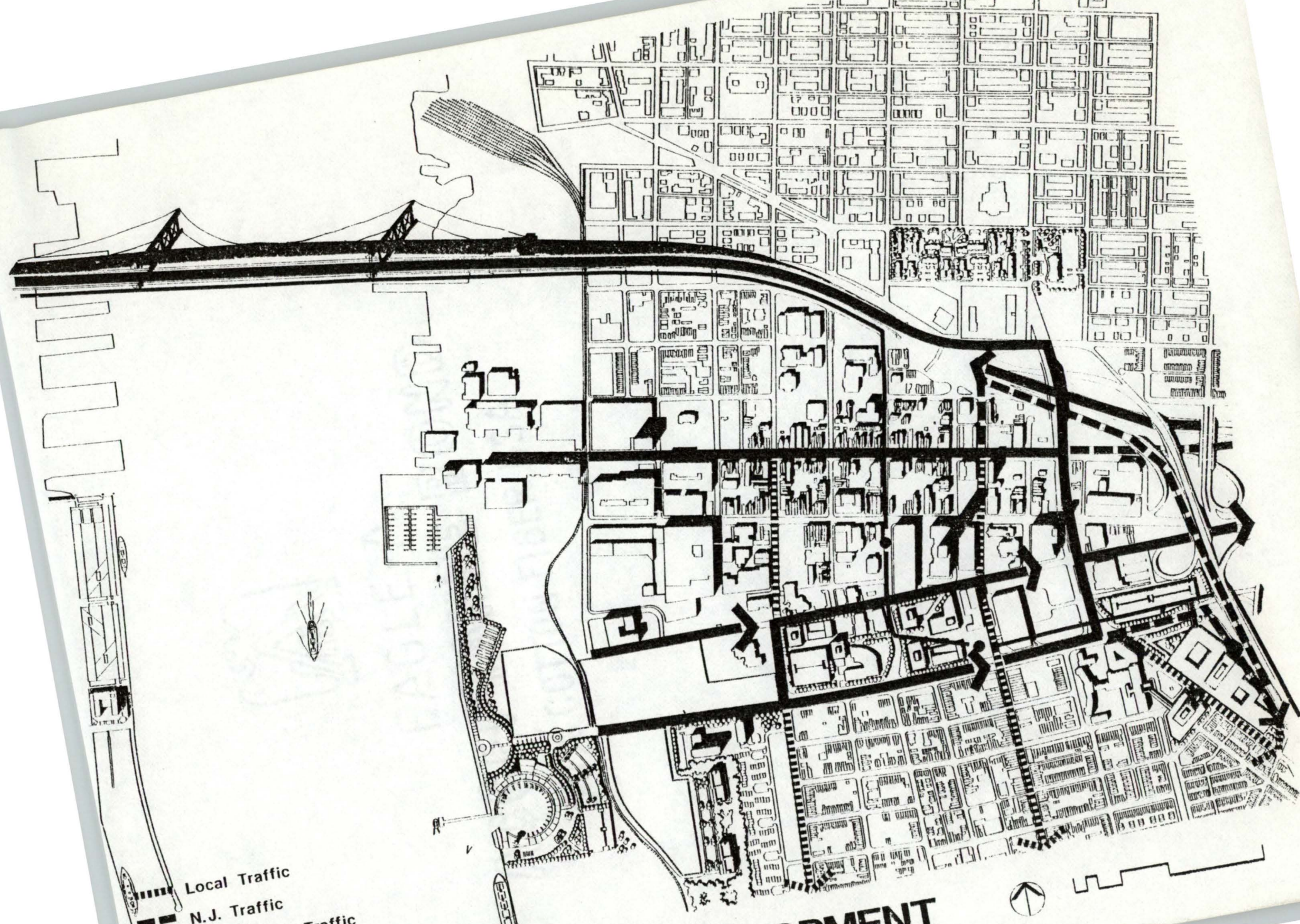




Local Traffic  
N.J. Traffic  
Philadelphia Traffic

# ARRIVAL ROUTES CAMDEN DEVELOPMENT

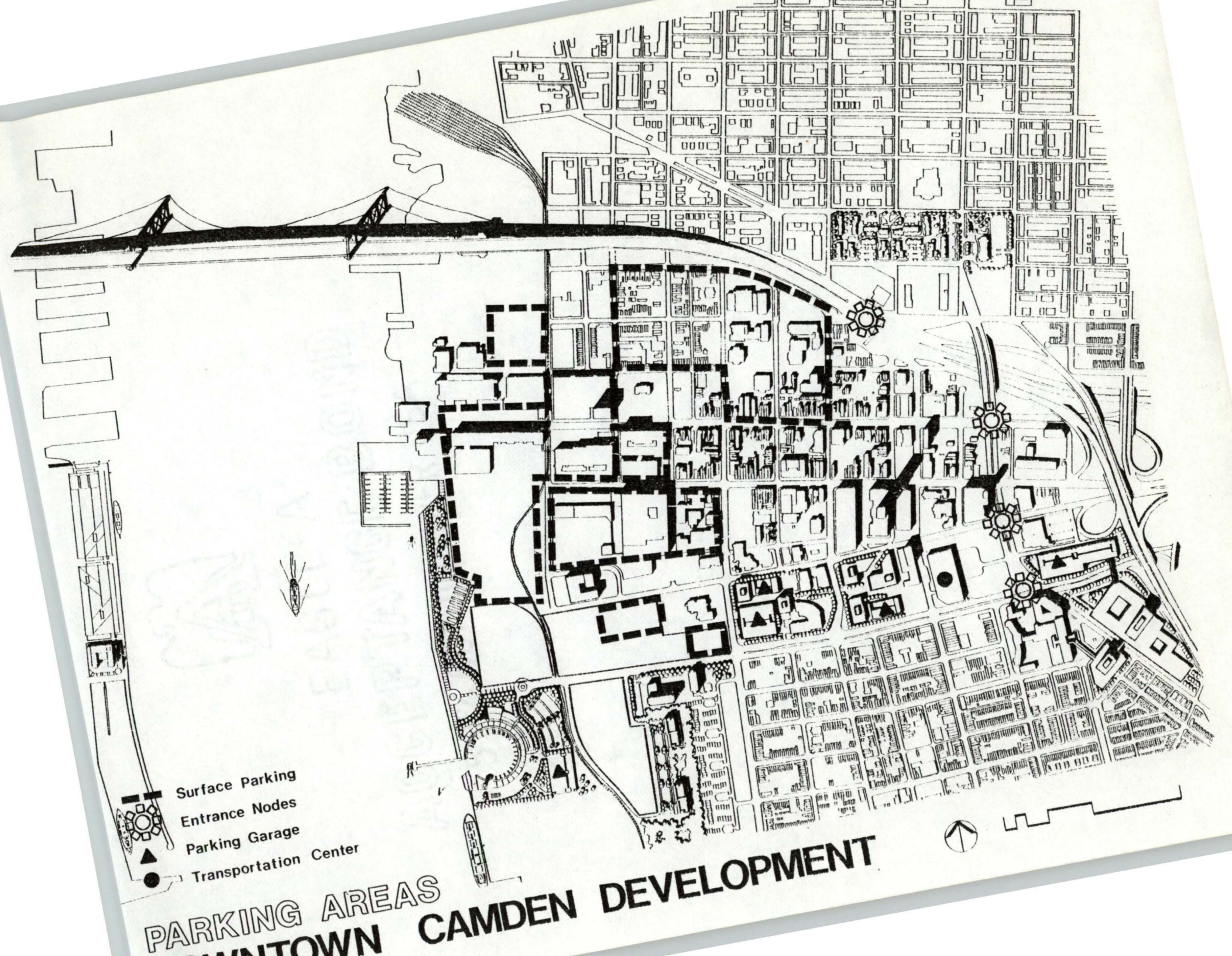




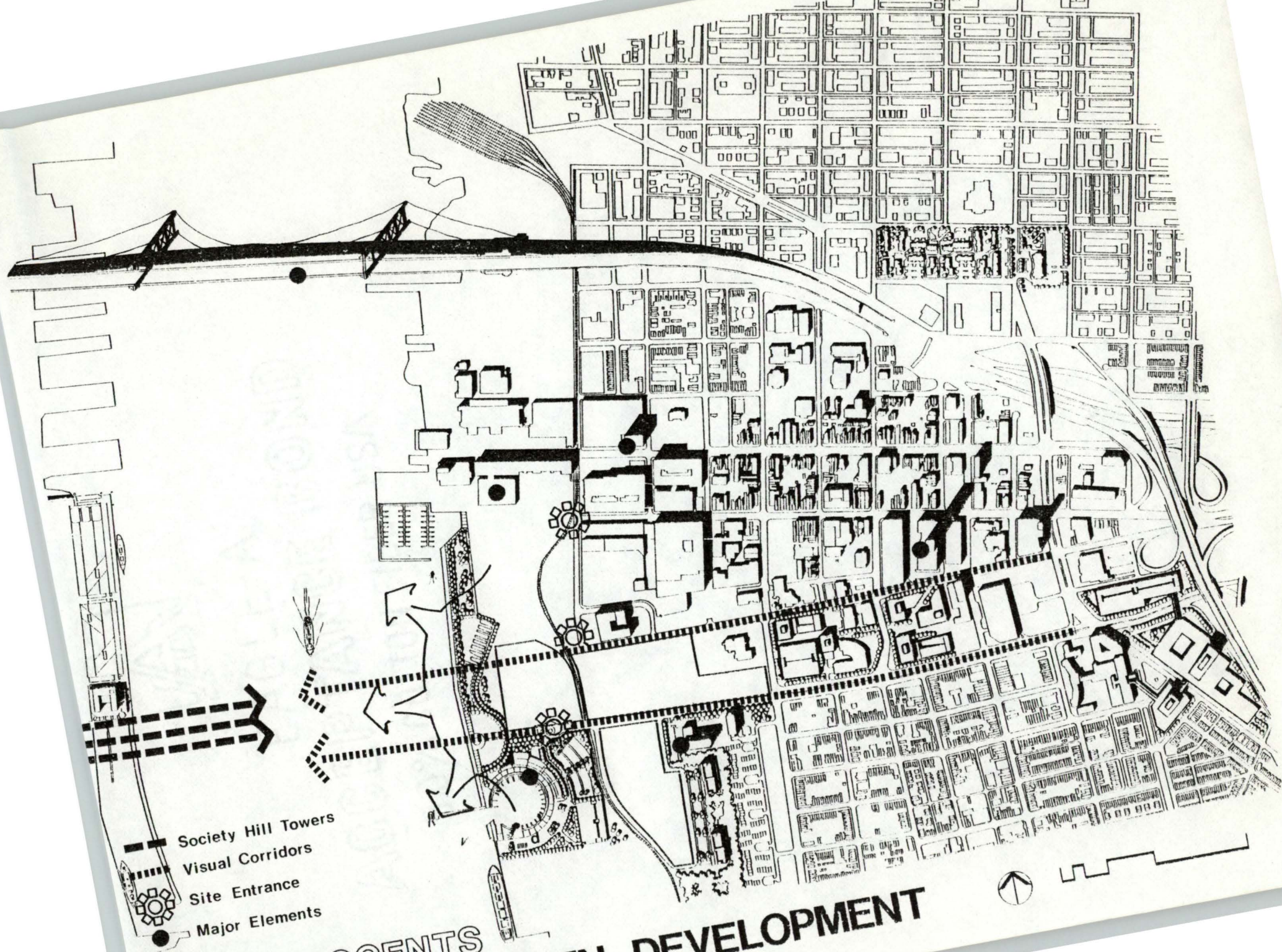
- Local Traffic
- N.J. Traffic
- Philadelphia Traffic

# DEPARTURE ROUTES DOWNTOWN CAMDEN DEVELOPMENT





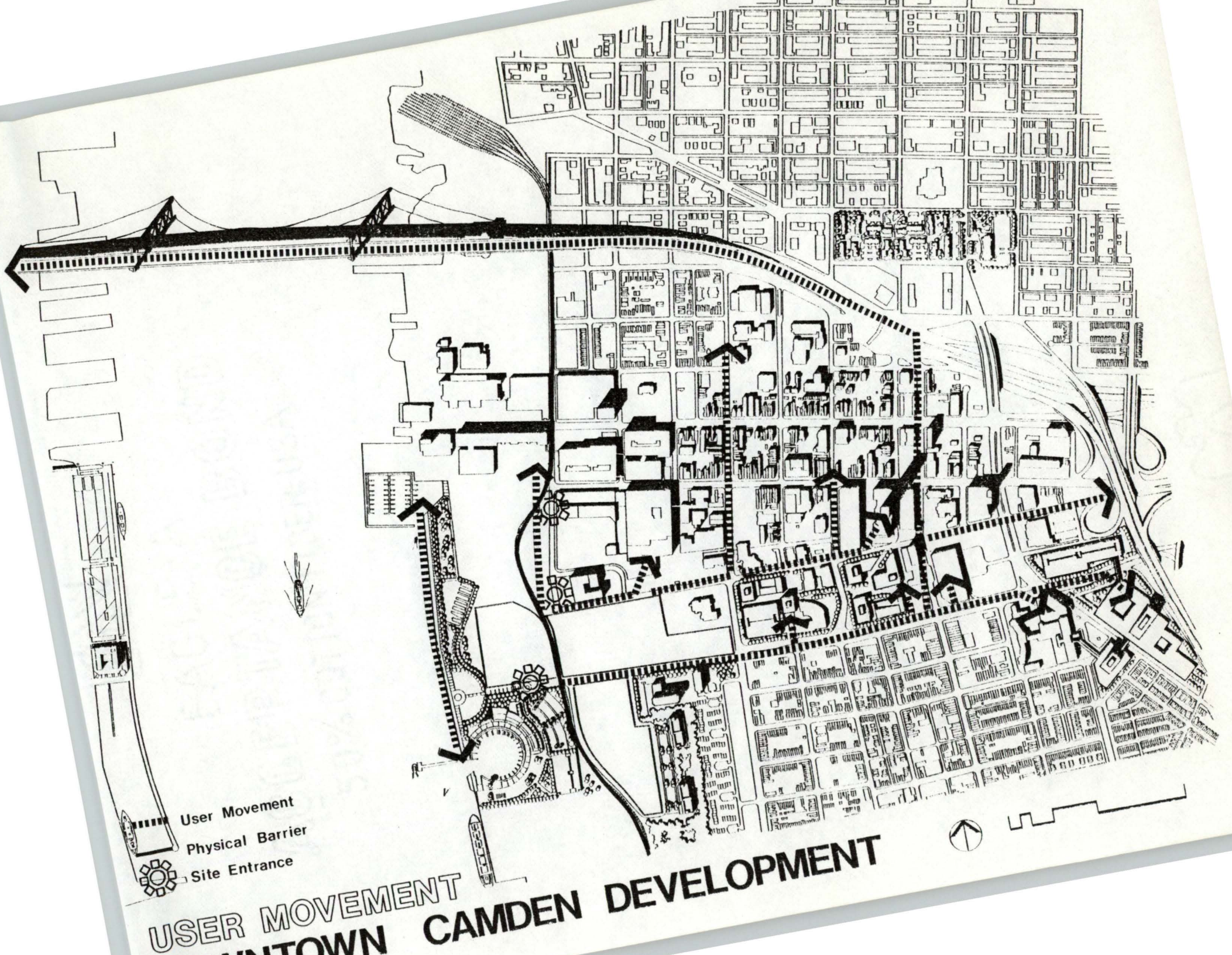




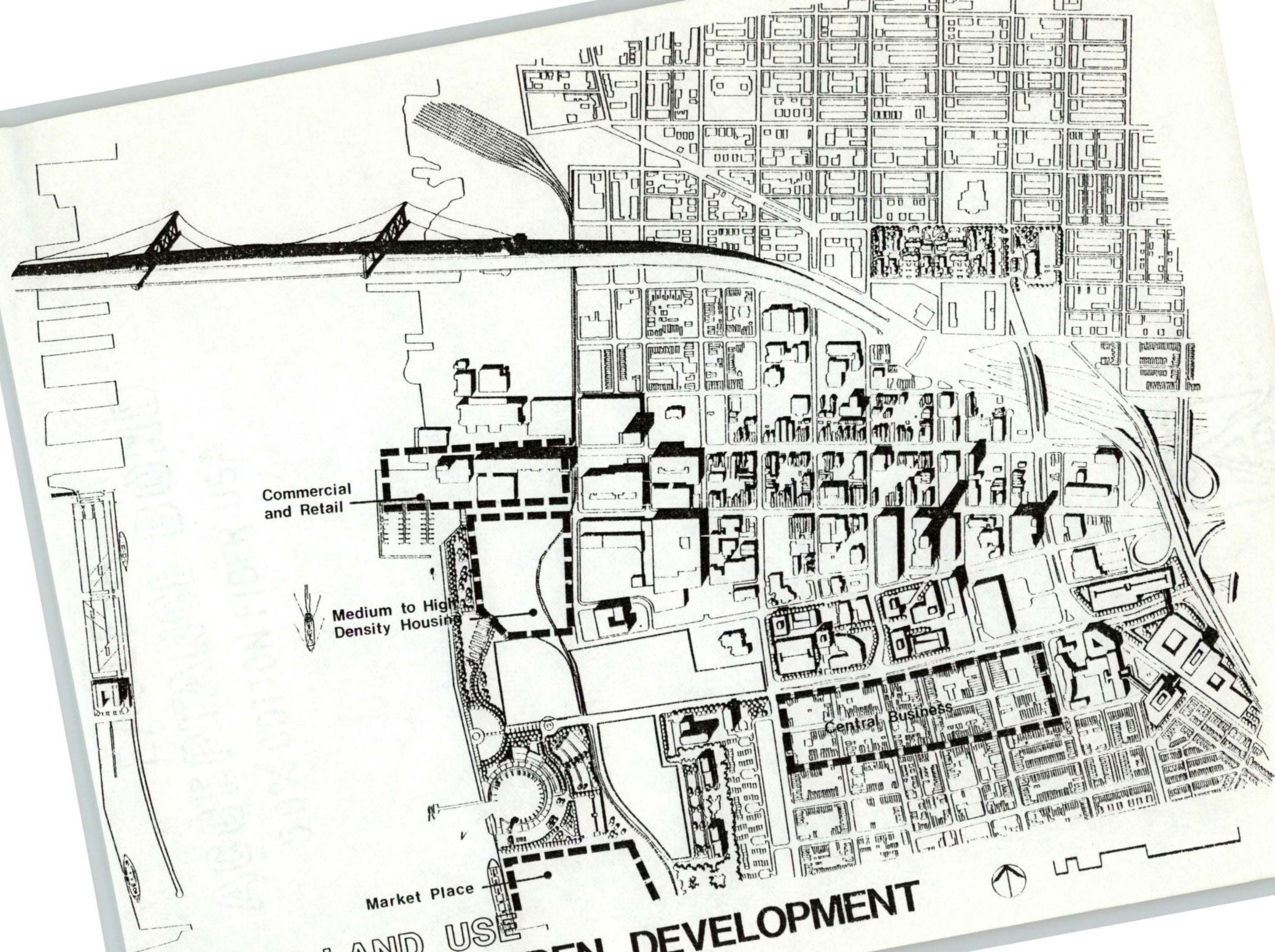
- Society Hill Towers
- ... Visual Corridors
- ⚙ Site Entrance
- Major Elements

# VISUAL ACCENTS DOWNTOWN CAMDEN DEVELOPMENT









**FUTURE LAND USE  
CAMDEN DEVELOPMENT**



**ARCHITECTURAL SOLUTION**



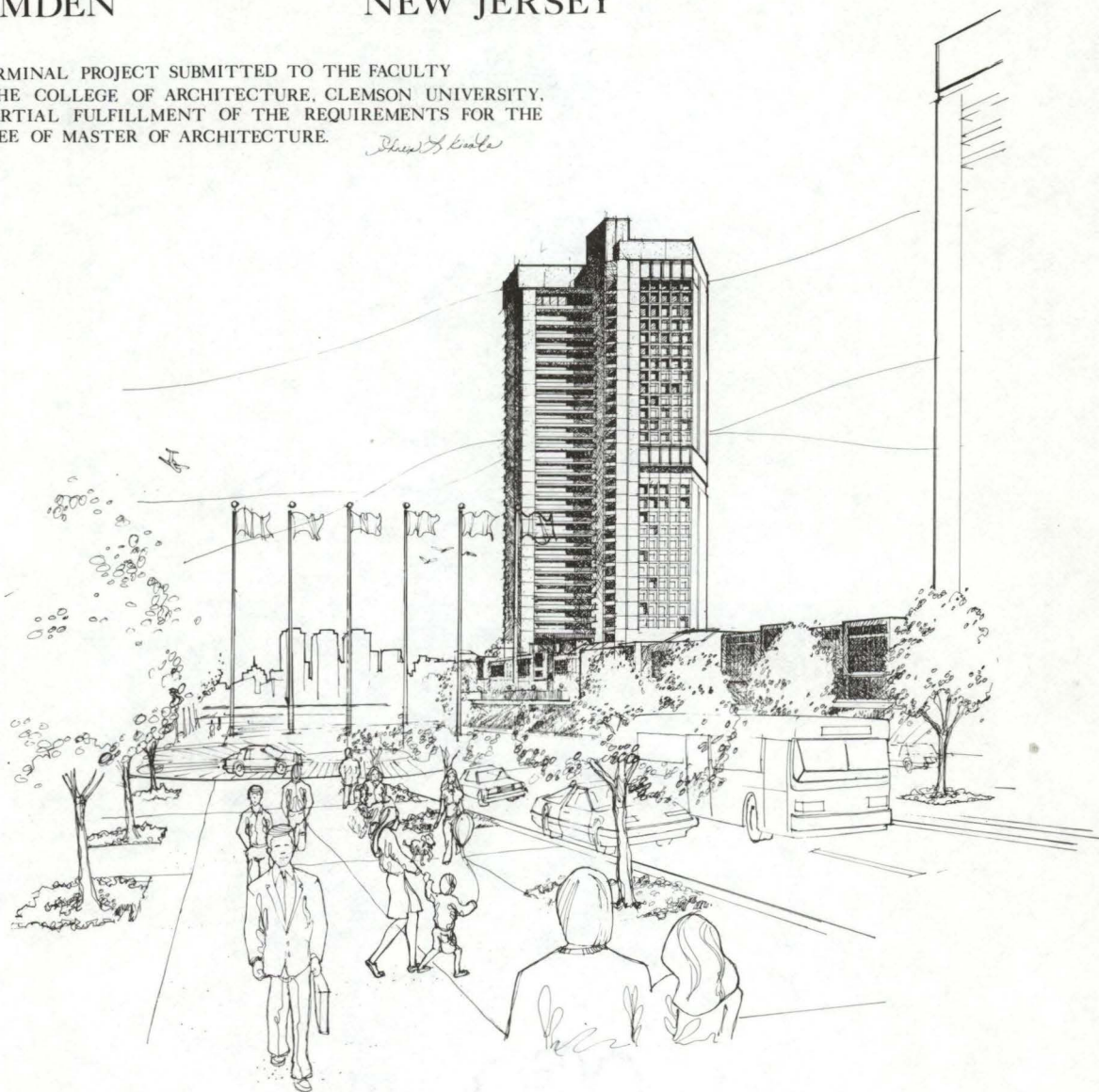
# CAMDEN WATERFRONT REVITALIZATION

CAMDEN

NEW JERSEY

A TERMINAL PROJECT SUBMITTED TO THE FACULTY  
OF THE COLLEGE OF ARCHITECTURE, CLEMSON UNIVERSITY.  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF MASTER OF ARCHITECTURE.

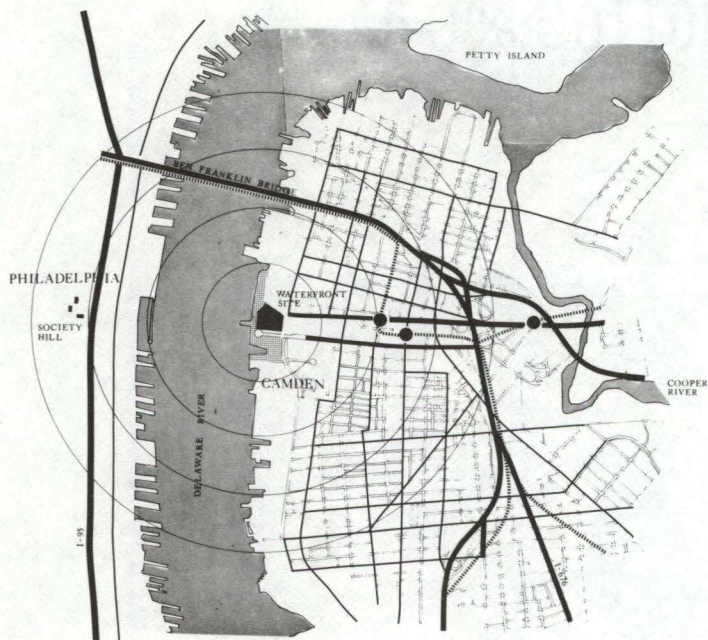
*Shawn J. Looe*



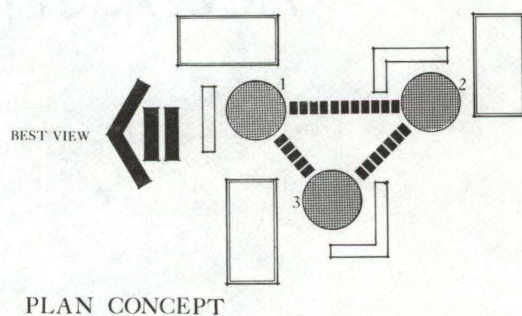
WATERFRONT APPROACH



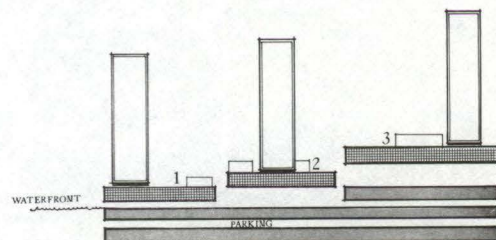




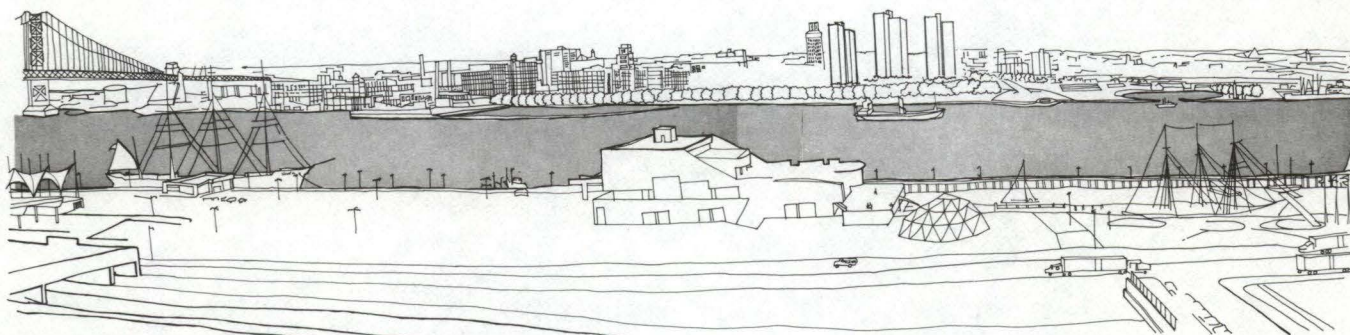
LOCATOR MAP



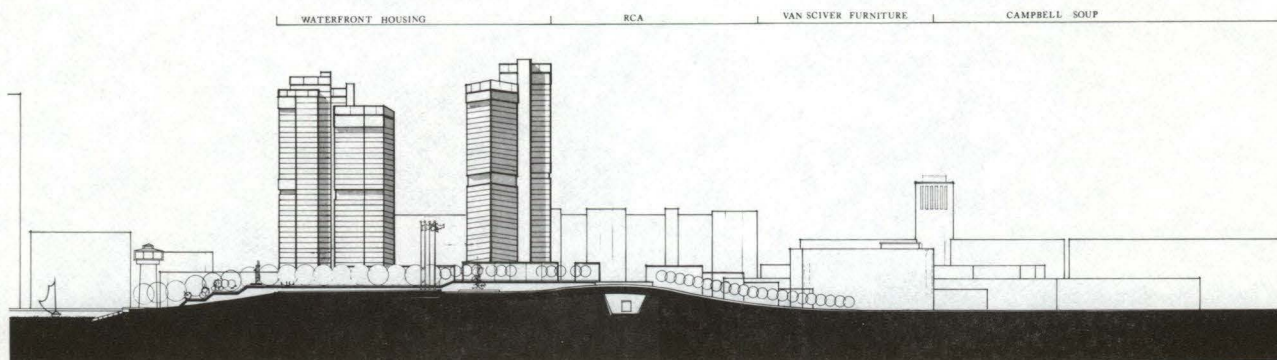
PLAN CONCEPT



SECTION



VIEW FROM PENNS LANDING

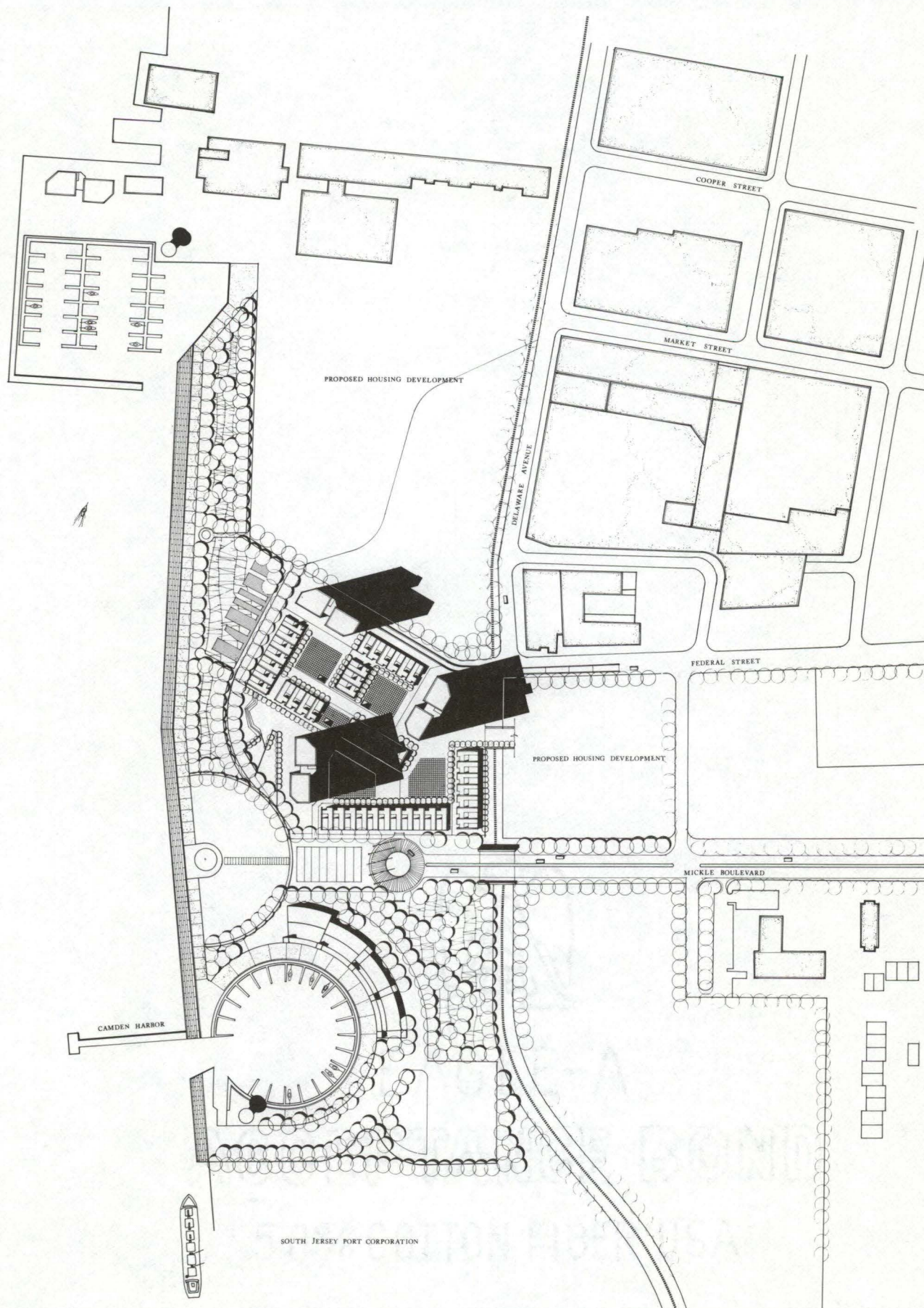


EAST-WEST SITE SECTION

SITE/CONCEPT



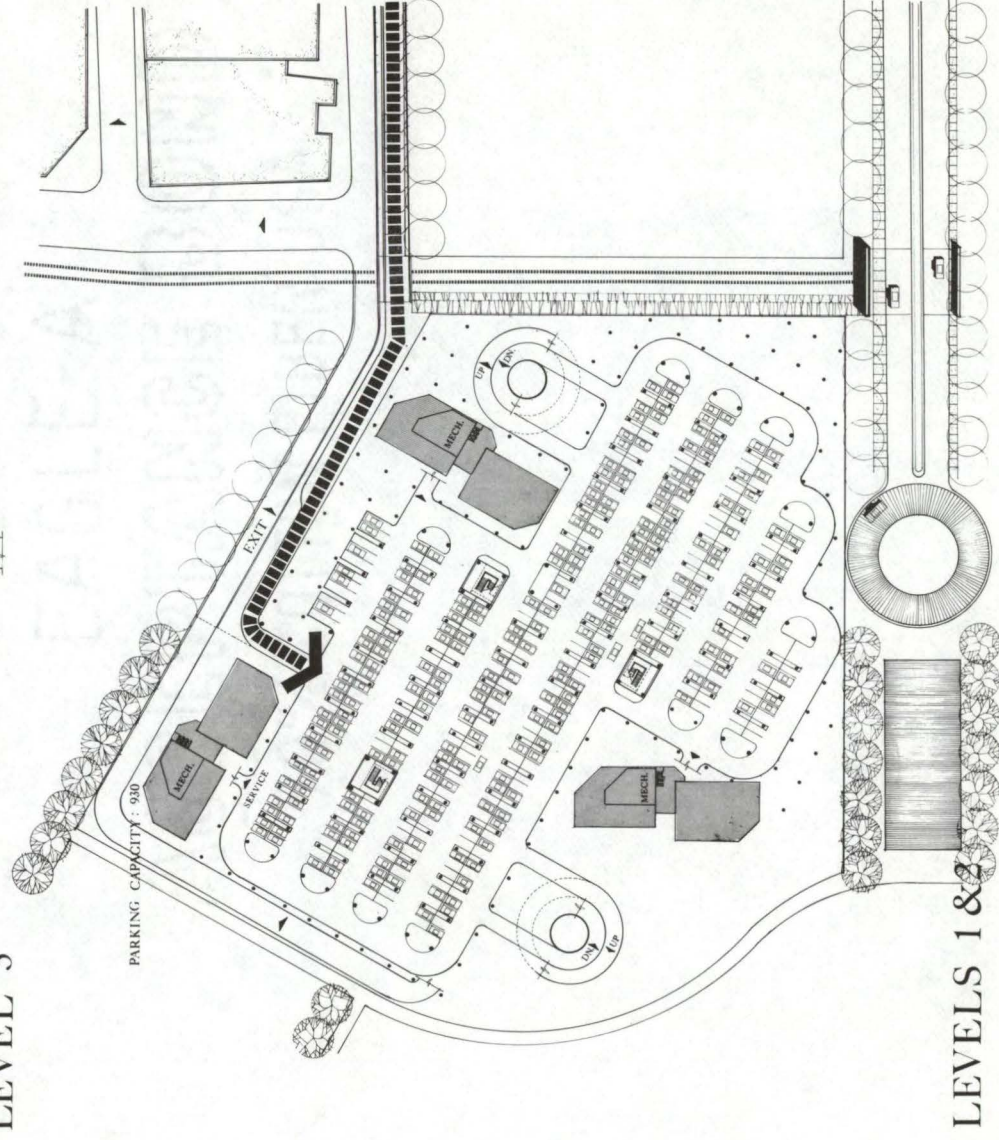
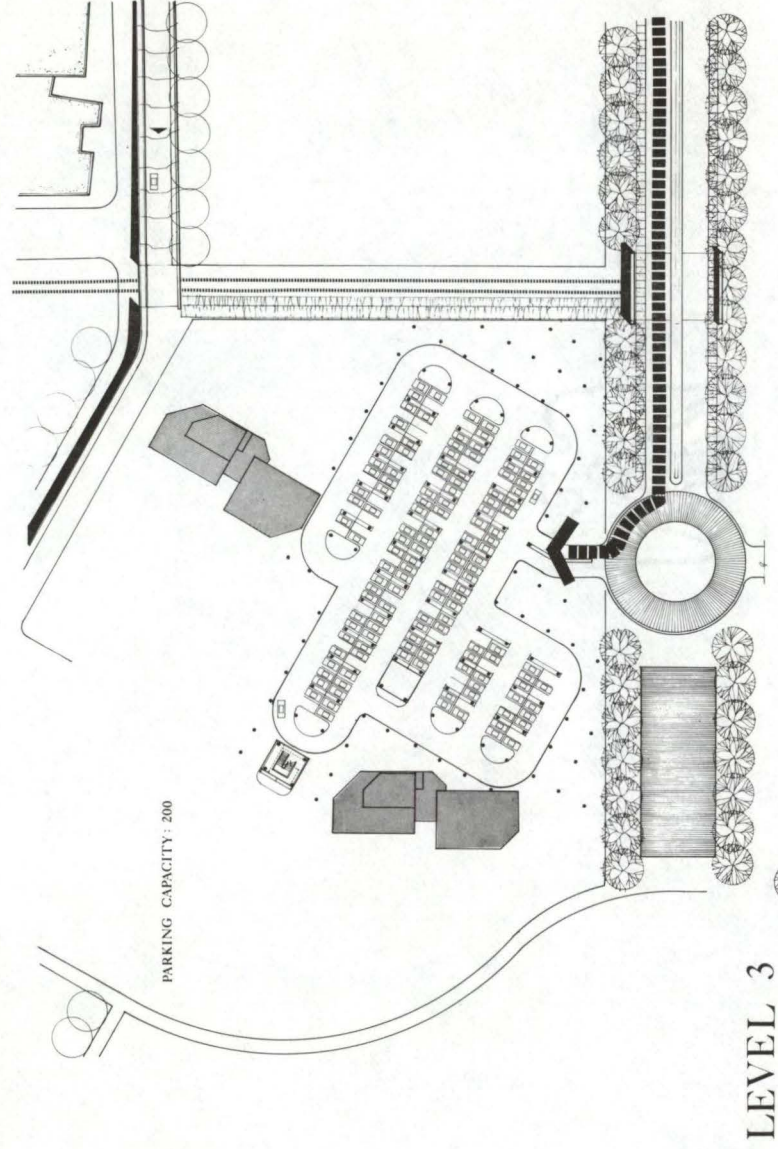




# SITE PLAN



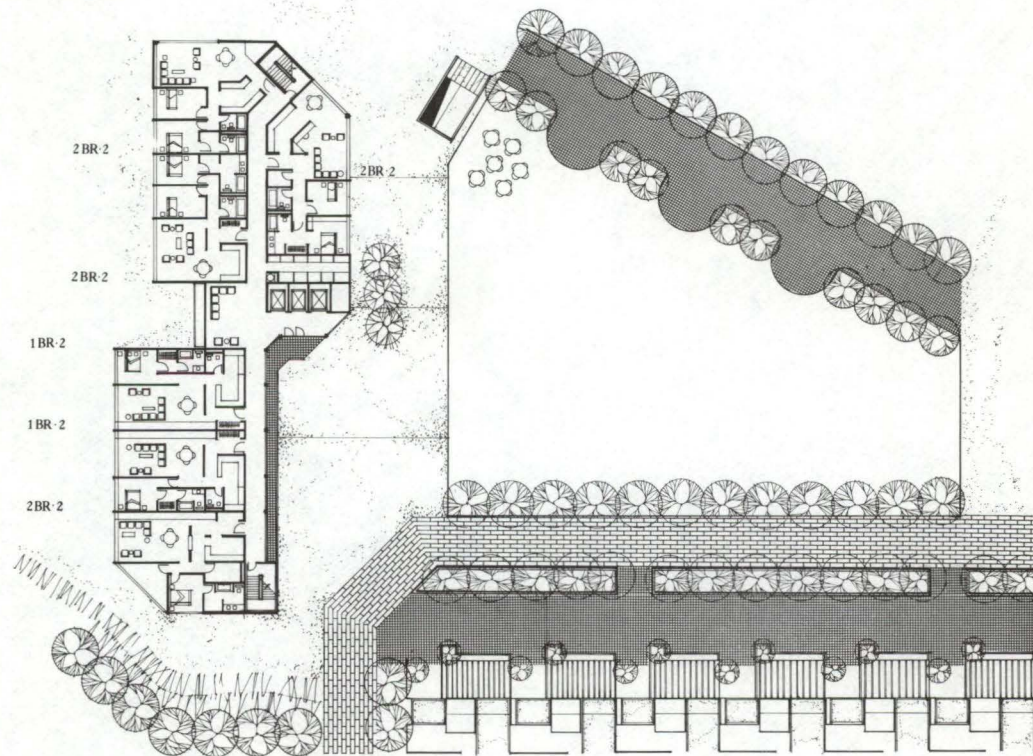




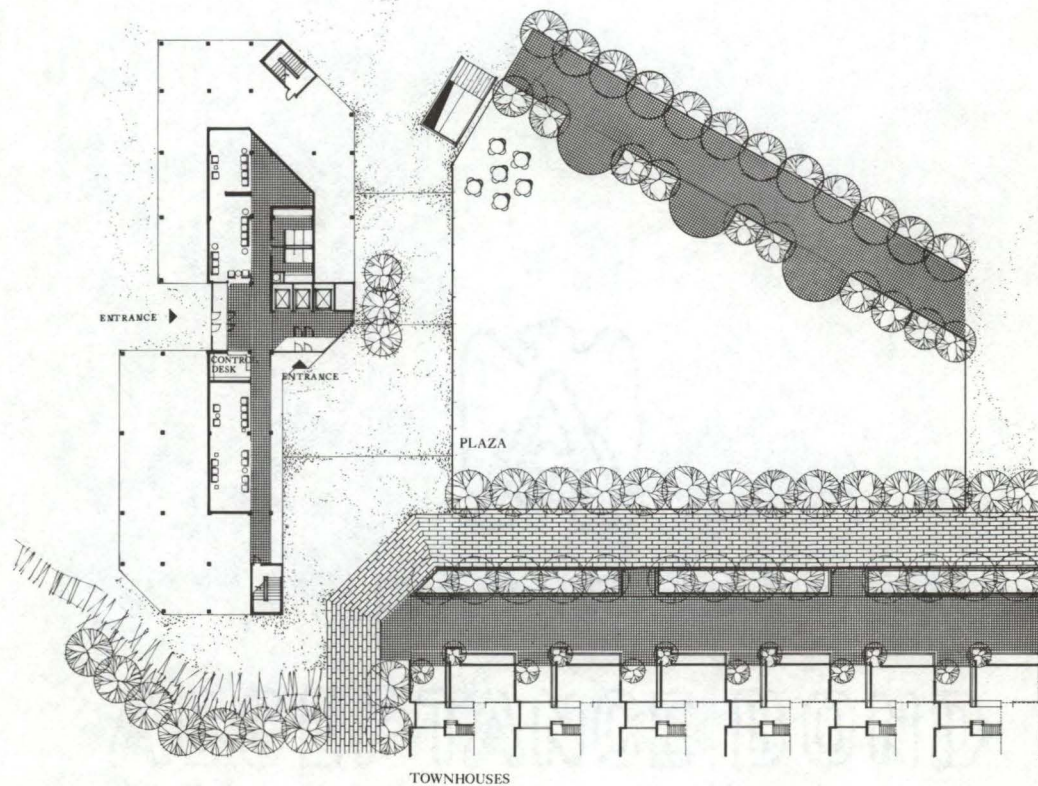
# PARKING







TYPICAL FLOOR



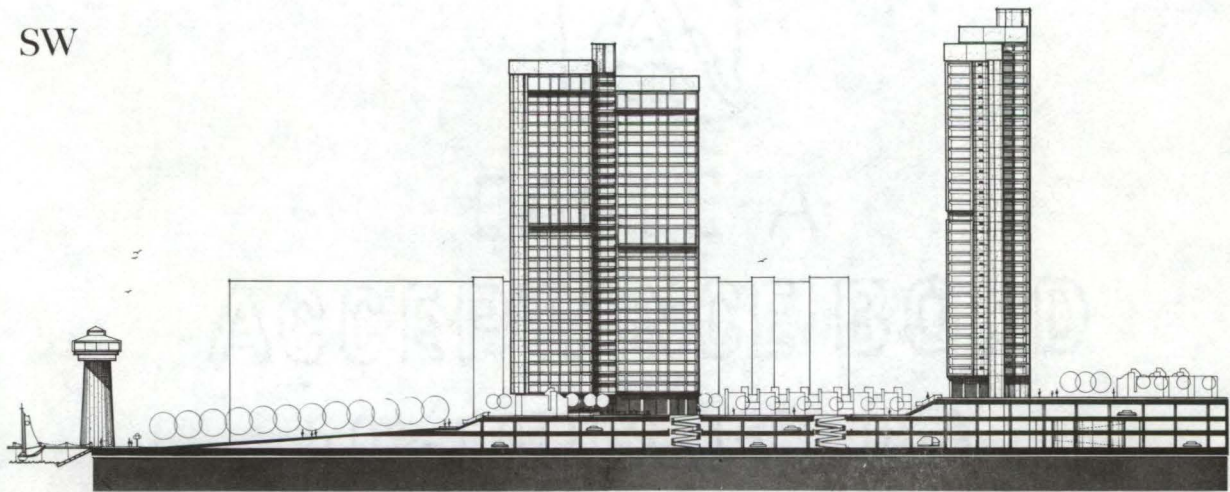
LOGGIA LEVEL

# HIGH · RISE PLAN

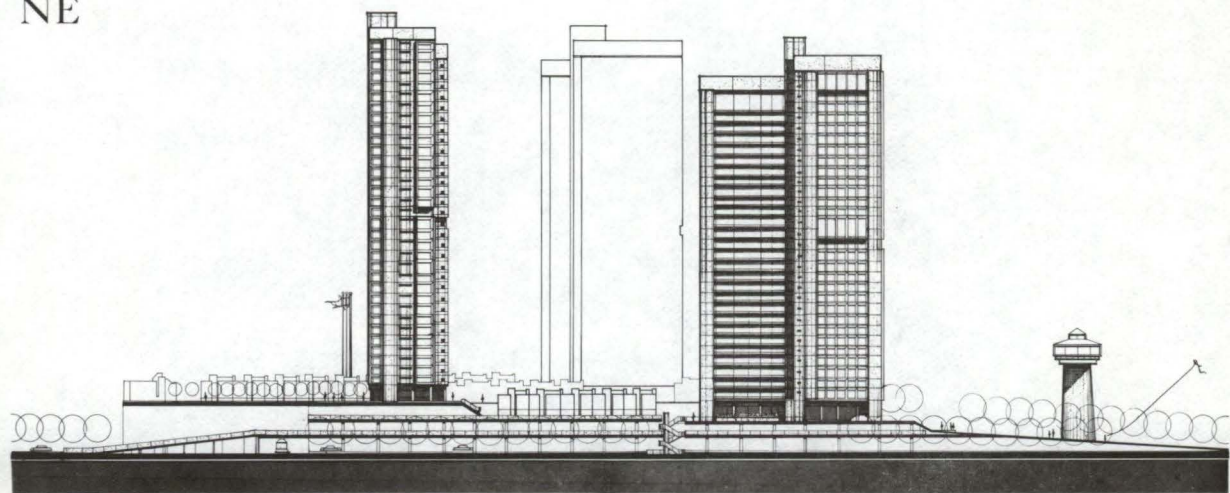




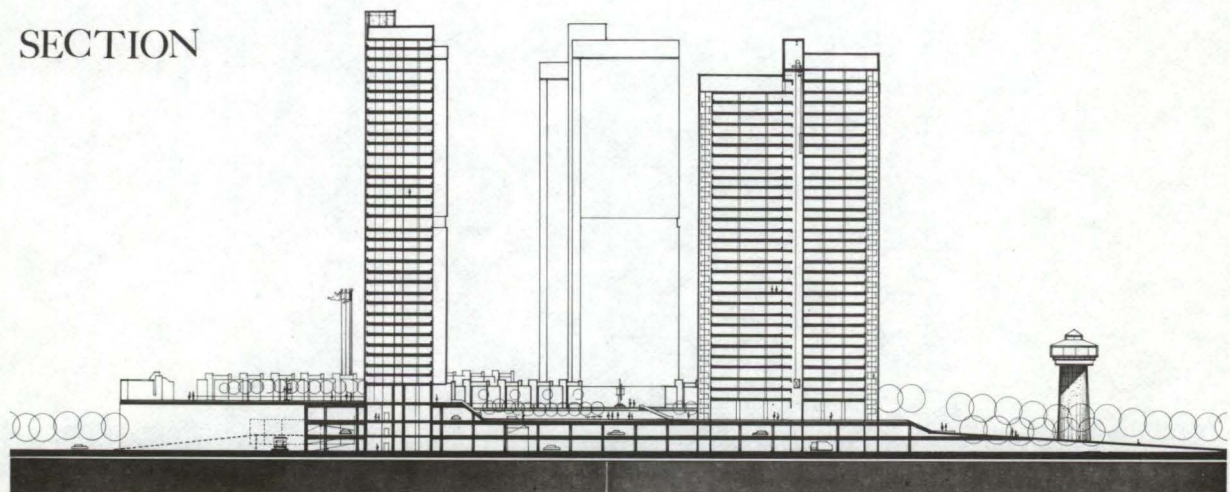
SW



NE



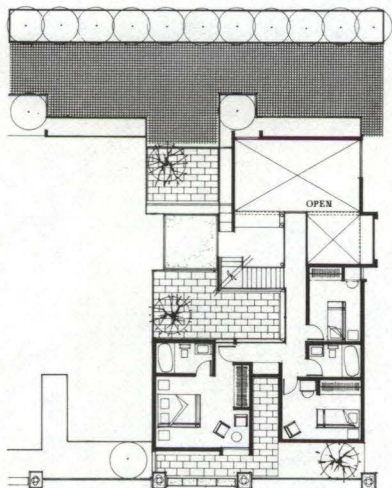
SECTION



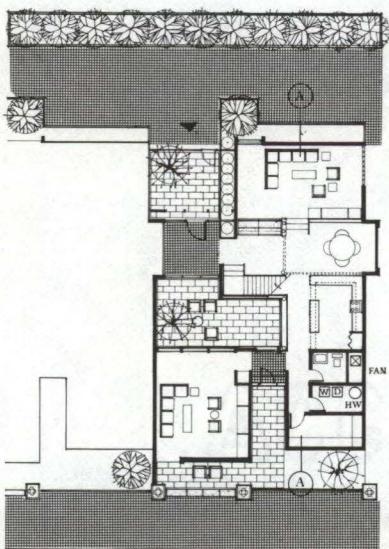
ELEVATIONS





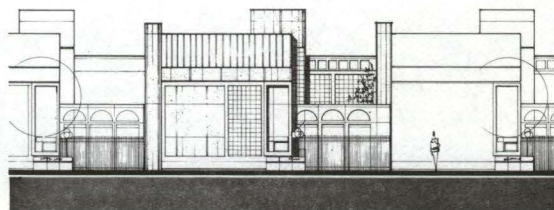


FIRST FLOOR

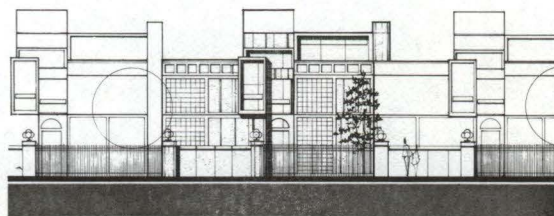


GROUND FLOOR  
PLANS

## ELEVATIONS

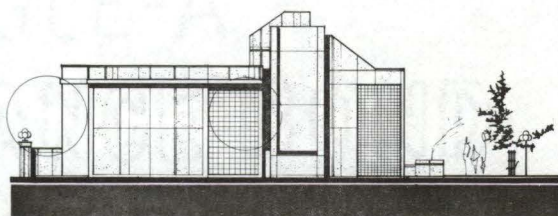


FRONT

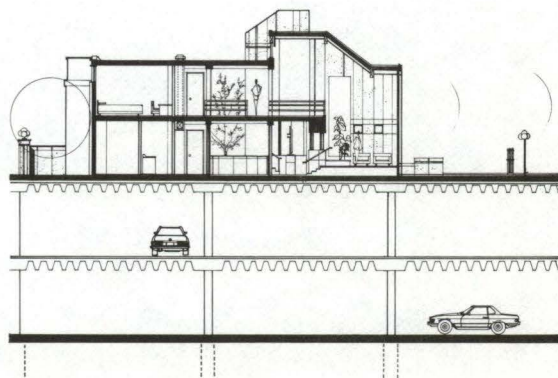


REAR

RIGHT SIDE



SECTION A-A

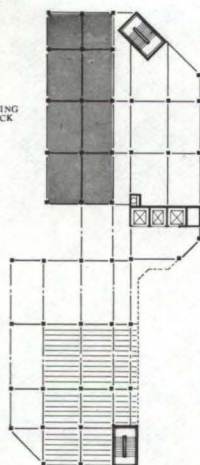


## TOWNHOUSES



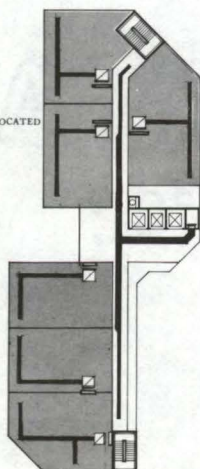


3" CONCRETE TOPPING  
ON 18 GA. STEEL DECK



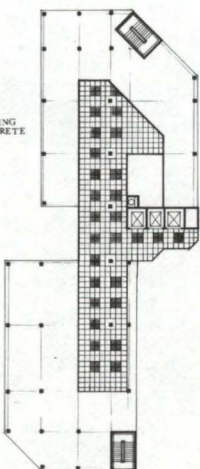
## STRUCTURAL

INDIVIDUAL AIR  
HANDLING UNITS LOCATED  
IN PLENUM SPACE  
ABOVE BATHROOM



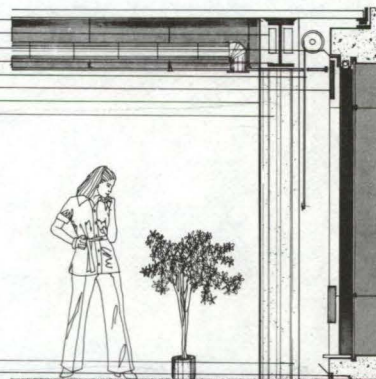
## MECHANICAL

LOGGIA LEVEL  
INTEGRATED LIGHTING  
SYSTEM WITH CONCRETE  
WAFFLE SLAB

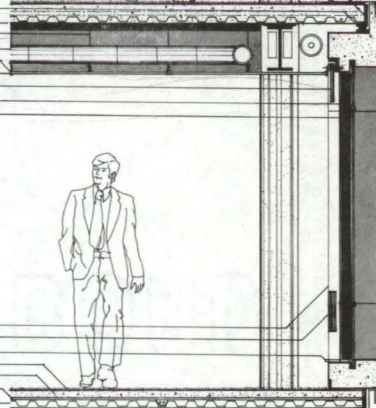


## LIGHTING

STEEL PLATE  
WELD ANGLE  
STEEL ANGLE  
STEEL BEAM  
SUN SHADE  
PRECAST PANEL  
2 LAYERS 5/8" GYP. BD.  
STEEL COLUMN



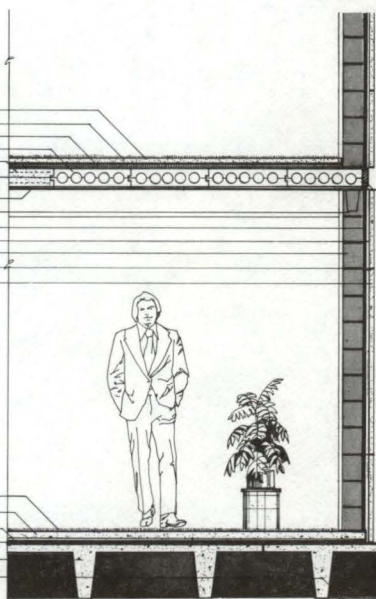
WELD TAB  
STEEL ANGLE  
NEOPRENE PAD  
2" INSULATION  
WIRE HANGAR  
MECHANICAL DUCT  
METAL CHANNEL  
5/8" GYPSUM BOARD  
PLYWOOD COLOR PANEL  
WINDOW MULLION  
REFLECTIVE GLASS



## HIGH-RISE SECTION

## TOWNHOUSE SECTION

CARPET & PADDING  
2" CONCRETE TOPPING  
2" RIGID INSULATION  
PRECAST DECK  
METAL CHANNEL  
STAINLESS STEEL REVEAL  
5/8" GYPSUM BOARD  
PRECAST BOND BEAM  
1" RIGID INSULATION  
1" AIR SPACE  
8" GROUND FACE BLOCK  
MASONRY TIE  
PRECAST PANEL



CARPET & PADDING  
3" CONCRETE TOPPING  
VAPOR BARRIER  
3" RIGID INSULATION  
CONCRETE DOUBLE TEE  
CONCRETE COLUMN





**FOOTNOTES**



## FOOTNOTES

<sup>1</sup> William B. Rick, Planning and Developing Waterfront Property. Urban Land Institute, Washington, D.C. June 1964, pg. 10.

<sup>2</sup> Rick, p. 9.

<sup>3</sup> Urban Waterfront Lands. National Research Council, National Academy of Sciences, Washington, D.C. 1980, p. 4.

<sup>4</sup> Urban Waterfront Lands, p. 9.

<sup>5</sup> Urban Waterfront Lands, p. 9.

<sup>6</sup> Urban Waterfront Lands, p. 213.

<sup>7</sup> Urban Waterfront Lands, p. 214.

<sup>8</sup> Donn Logan, "Housing and Urbansim," from The Form of Housing by Sam Davis ed., Van Nostrand Reinhold Co., New York, 1977, p. 41.

<sup>9</sup> Sam Davis, The Form of Housing, Van Nostrand Reinhold Co., New York, 1977, p. 13.

<sup>10</sup> Davis, p. 16.



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5-3  
T-14